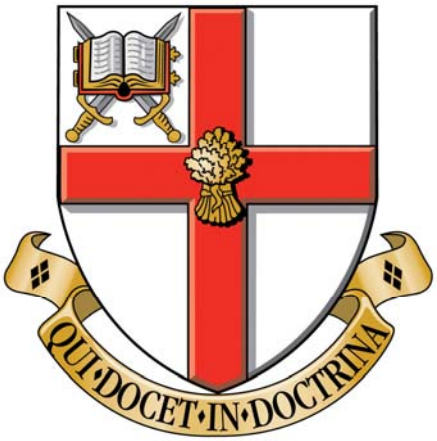

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Perspectives on the conservation of industrial heritage in the National Parks with specific reference to the Lead Mining and Smelting Industry in the Yorkshire Dales National Park

Dissertation submitted for the Degree of Master of Arts in the University of Liverpool in part fulfilment of the modular programme in Landscape, Heritage and Society

Christopher Green
October 2005

Old Gang Mill, Swaledale, North Yorkshire

Abstract

The main aim of this study was to investigate the current state of the industrial heritage of the National Parks of England and Wales and the ways in which this industrial heritage is being preserved and interpreted from the specific standpoint of the remaining fabric of the lead industry within the Yorkshire Dales National Park. Assessments were made of the degree of decay of this fabric over the last 50 years by comparing the current state with that described in an early study of the Industrial Archaeology of lead smelting in the Yorkshire Dales. Investigations were made into the policies and action plans followed by the National Park authority and voluntary bodies interested in this industry. Finally studies were made of other lead mining and smelting sites elsewhere in England and Wales to see how approaches varied and to compare them with those taken in the National Park. The study found evidence of deterioration in the fabric, significant in places, as well as an apparent public indifference to it and the story it tells. However it did generally find a positive attitude from the authorities involved towards conservation issues. This was especially true in the National Park, largely a consequence of the priority that National Park authorities must place on preserving their cultural heritage. However, the rate at which some of the fabric is deteriorating, along with the finances available, may mean difficult choices as to which sites get conserved, interpreted or simply recorded.

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List of Abbreviations

EH	English Heritage
HER	Historic Environment Record
MPP	Monument Protection Programme
NMR	National Monuments Record
NMRS	Northern Caves and Mines Research Society
NPA	National Park Authority
PDMHS	Peak District Mines Historical Society
PROW	Public Right of Way
RCHME	Royal Commission on the Historical Monuments of England
SMR	Sites and Monuments Record
YDMT	Yorkshire Dales Millennium Trust
YDNPA	Yorkshire Dales National Park Authority

1 Introduction

1.1 Background

The National Parks of England and Wales are probably most closely connected in most peoples' minds with leisure and relaxation. Millions of us visit them every year as a means of escaping for a time the stresses of urban life. What is our perception, though, when we visit our National Parks? Arguably, we see them primarily as areas of outstanding scenic beauty to be enjoyed on foot on a steep hiking trail, on the water on a canoe or pleasure steamer, or through the window of a car negotiating a narrow winding mountain pass. If we were to think of the human rather than purely geographical aspect of the parks then we might think of the farming landscape, the dry stone walls, the fields filled with sheep and lambs and punctuated with solitary ancient farmsteads and barns, or we might remember the villages with their rows of scrubbed cottages, neat greens and convenient tea rooms. What we do not always appreciate initially until we start digging below this surface appearance is the fact that for centuries many areas of our National Parks have been hives of industrial activity and were in no sense of the words the rural idyll many of them appear to be today.

The reason for this of course comes down to geology. Leaving aside the newly designated New Forest National Park and the Broadlands Authority that covers the area of the Norfolk Broads, all of the parks in England and Wales lie in so-called 'Highland' Britain, the areas to the north and west that have the oldest and most complex geological formations in the country. While these rocks are already useful in themselves as building, roofing or road building material, they are even more important as a source of mineral wealth, of coal, copper, tin and iron. More specifically in terms of this study, they are also a primary source of lead, particularly in the Carboniferous rocks of the Peak District and the Yorkshire Dales. And it was not just the geology but the geomorphology that helped instigate industrial development. The presence of numerous fast-flowing streams in these upland areas helped, for example, the development of the woollen industry round the fringes of the Pennines. The expertise that grew from this, along with technical innovation in the 18th and 19th centuries, encouraged the early development of the cotton industry in these areas.

As we actually investigate these landscapes this becomes clearer. A walk up Snowdon will take you past ruined slate communities sitting in the very shadow of the mountain; around the fringes of Dartmoor the landscapes of old industrial development illustrate a whole culture based around the copper and tin mining industry; a drive down a Derbyshire dale can end up as a master class in the beginnings of the Industrial Revolution.

The genesis of this study has come from many such excursions, intended and accidental, into the industrial landscapes of the National Parks, and a questioning as to what extent these landscapes, firstly, are appreciated, and secondly, are actively being preserved and interpreted. The impression one gets is often one of neglect, of a landscape that is quietly subsiding into the earth from whence it came. This is not helped by the fact that we are often talking here about quite remote areas as these minerals had to be got at where they occurred and geology by its nature does not always put them where they can be easily accessed. These landscapes are also not always necessarily aesthetically pleasing. A ruined abbey in a wide Yorkshire dale is visible, accessible and an obvious candidate for diligent conservation. A lead mine high on a moor above a long narrow side valley may be visited by few and probably loved by fewer.

Arguably, however, the remains of industrial past are as important, if not more so, than the relics of our ecclesiastical past because of what they tell us about our cultural history. Indeed, there has been a major recognition over the last 50 years of the importance of our industrial heritage and the need to mark that recognition in some way, either by simply protecting a site by scheduling it or by taking more proactive measures to ensure its continued existence. In urban areas the pressures of the modern world create problems for the active conservation of our industrial history as demands on space for development mean that much is being lost year on year. But at least we know what is disappearing - in rural areas such as the National Parks, different factors apply. The problem here is more of neglect, that these remote vestiges of our industrial past will simply slowly fade away and be forgotten, stone by collapsed stone. Scheduling a site as an ancient monument, as many have been, is a useful first step but will of itself not stop this process of decay.

1.2 Purpose

The purpose of this study is therefore primarily to investigate the current state of our industrial heritage within the National Parks of England and Wales and the ways in which

this industrial heritage is being preserved and interpreted. It will ask questions as to whether there are active measures in place, not just to record the various elements that make up this heritage, but also actively to conserve and preserve them, interpret them and present them back to the general public as one of the elements that make up the totality of the National Park 'package'. It will investigate the extent to which conservation activities are led by the National Park authority itself and governed by an overall strategy or are governed by individual initiatives by the park itself or by other institutions or voluntary bodies. The study will hope to draw conclusions as to how effective the various approaches are and how future policy and strategy might increase this effectiveness.

1.3 Scope

In order to keep the focus tight the major part of the study will concentrate on the Yorkshire Dales National Park and within that specifically on the relics of the lead industry to be found within the borders of the park. Though reference will be made to earlier and later periods of development it will also concentrate of the most important period of mining development, namely the late 18th century and the 19th century and within that specifically on lead mining and smelting activities. It was during this time that the increasing mechanisation of mining along with developments in smelting technology left the greatest impact on the landscape of the lead-mining areas in terms of what was built above ground, be it mine headgear, multi-furnace smelting mills[1] or long lead flues leading from the smelters to chimneys high on the surrounding moors. The study will also use comparisons with conservation efforts in other areas where the lead industry was historically important.

The study will not cover other elements of the lead industry such as housing, social organisation or transport infrastructure and will also cover surface structures only. The physical state of preservation of mineshafts and adits will therefore be covered only briefly, but flues, though these are often still roofed, will be covered because of the physical mark they make on the surface landscape.

[1] These structures are known in the literature either as 'smelting mills', 'smelt mills' or 'smeltmills'. This work will use the term 'smelting mill' throughout unless quoting a source or a title that uses the term 'smelt mill' or 'smeltmill'.

1.4 Sources

The study will not attempt in any way to trace the history and development of any of the sites used in the study. There have been a plethora of such studies made over the last 50 years into both individual mines and mills and the wider picture of the development of the lead industry in these areas and it is not the intention of this study to add to those. The study will not therefore be using as primary sources contemporary records from the era under discussion. In the context of this study, the primary sources are essentially, in both the Yorkshire Dales study area and other areas used for comparison:

- The lead-mining and smelting landscape itself in its current state of preservation.
- Any interpretation relating specifically to the lead industry in the form of:
    a. On-site signs or panels
    b. Locally available leaflets or guides
    c. Educational material made available to schools and colleges

The secondary sources fall into two categories:

- Previous studies and surveys made into the landscapes of lead-mining in the Yorkshire Dales, to be used to determine the extent to which the visible evidence of industrial activity now may have degraded since the time of the study.
- Formal policies, plans and study documents produced by, or in association with, the National Park authorities and other statutory bodies such as English Heritage and local authorities.

1.5 Approach

1.5.1 Investigating the physical fabric

The growth of interest in the physical relics of our industrial past led in the 1950s and 1960s to a number of important early studies recording specific aspects of that past. In the context of the Yorkshire Dales, one of the most important of these was Robert T Clough's *The Lead Smelting Mills of the Yorkshire Dales*, privately published by the author in 1962. Rather in the manner of an early 20th century folksong collector collecting the 'old songs' before they disappeared, Clough was conscious that this was a disappearing heritage:

> "The observations were carried out amongst buildings many of which have been disused for a century of more and whose crumbing remains, now unnoticed, may be seen in many a lonely gill and barren moor... All that now remains after the working and striving, the losing and gaining, is in most cases little more than a crumbling wall or a fallen arch to mark the place of something that is now almost a forgotten memory"[2]

He was therefore keen on describing the history of these mills from documentary sources, but also on accurately describing the physical remains of the mills by means of photographs and carefully surveyed plans and elevations. These surveys were carried out over a number of years from around 1945 to the late 1950s and have the potential to form a good baseline source from which to measure any physical decline in the state of the fabric of the buildings surveyed.

The initial phase of this study was therefore to take a number of the areas listed in Clough's book, revisit the sites surveyed and by re-photographing scenes shown in the book and doing some basic resurveying of the sites come to a conclusion as to how much of the fabric might have been lost in the intervening 40 to 50 years. The site visits would also look for any evidence of any consolidation or restoration that had taken place and of any obvious current degradation of fabric, and for any attempts made to interpret the sites for the benefit of casual visitors. Initial investigations into Clough's drawings showed that the plans relied as much on speculative reconstruction of what the buildings might have looked like as they did on physical recording of the actual fabric present and that Clough was not as diligent as he would have to be nowadays about recording which was reconstruction. The surveying was therefore mainly just done to verify the general dimensions and to indicate properly which parts the fabric were actually extant. The photographic evidence was found to be the most useful source of comparison.[3]

Following the site visits further investigation was carried out into each site to determine what surveys, excavations and restorations have actually been carried out post-Clough, and under whose auspices. Contact was made with the organisations to obtain details of

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[2] Robert T Clough, *The Lead Smelting Mills of the Yorkshire Dales* (Published by the Author, 1962), p. 1

[3] Please note that in order that direct comparisons could be made with Clough's work, all measurements taken during the course of these surveys were made in feet rather than metres. Any references to measurements in the text of this document are therefore also in feet.

any documentation supporting the work they carried out. These included the following authorities, trusts and voluntary bodies:

- Earby Mines Research Group
- Yorkshire Dales Millennium Trust
- Yorkshire Dales National Park
- English Heritage

1.5.2 The policy framework

The second strand of investigation was to look at the Yorkshire Dales National Park Authority and to determine the place which the preservation and interpretation of the industrial landscape has in the overall list of priorities that any working National Park must have. This was looked at from a policy point of view and from a practical point of view. The basic question to be answered was whether the National Park:

1. Has a proactive view of its responsibilities with regard to the landscapes left by the lead industry, and a consistent and coherent idea of how the visiting public should be informed of that part of the park's heritage, or,
2. Whether it rather takes a reactive view of things and treats conservation issues in a piecemeal fashion when funding and / or suitable partners in the form of trusts or voluntary bodies appear.

To this end, this part of the study involved collation of National policy guidelines and statutory records, park policy documents, material made available to the public in the form of leaflets and guides, information on partnerships they have with other bodies such as English Heritage and the Yorkshire Dales Millennium Trust, as well as the evidence gleaned in the field studies.

1.5.3 Investigating other approaches

The final strand to the investigation involved looking at how the question of preserving and interpreting the remains of the lead mining industry is approached in a selection of other contexts outside of the Yorkshire Dales National Park, such as a voluntary organisation of mining enthusiasts, a local authority, a national heritage body or a heritage trust.

1.5.4 Conclusions

The study concludes by drawing together these strands to reach some conclusions on:

1. The degree to which the industrial heritage of the National Parks is being degraded over time and whether the situation is different here to other similar areas outside of the control of National Parks;
2. Whether there is a case to be made for the active conservation of industrial relics;
3. What the best approaches are to the conservation, preservation and interpretation of industrial relics in terms of cost effectiveness, educational value and historical integrity.

2 Site Visits in the Yorkshire Dales National Park

2.1 Approach

The first task in choosing sites to visit was to determine which sites in Clough's book lay within confines of Yorkshire Dales National Park. By comparing this list with the Yorkshire Dales National Park policy document drawn up by R. White ten years ago which listed sites which had priority for conservation activities, it was possible to choose sites:

- where interpretation schemes have been developed (the Grassington Moor area, including the Cupola Smelting Mill);
- where consolidation activities have been paramount (the area of Swaledale between Long Row and Langthwaite, including Old Gang, Surrender and Grinton Smelting Mills);
- that were not covered in the policy document to see how they have fared over time (the area of Wensleydale near Redmire and Castle Bolton, including Cobscar Smelting Mill).

Initial visits to each site looked at the general above-ground landscape: mines, smelting mills, flues, chimneys and water features. Notes were taken on the general state of preservation of the sites, whether any concerted efforts appeared to have been made to consolidate and conserve any features, to what extent the sites were being presented back to the public, and what the general style and effectiveness was of that presentation. Other sources of presentation material provided by the National Park and other bodies or publishers were also obtained. These included general guide books and pamphlets, educational material and web resources.

To effect the comparison with the state of preservation in Clough's time, photographs were taken at each site that coincided with those taken for his book and a visual comparison made to determine features that had disappeared or been altered. Two sites were chosen for further site visits at which the detail of Clough's plans were verified to determine again what seemed to have disappeared but also to gain a view as to whether this was a result of speculation in Clough's original drawing up of the plan, true loss of fabric, or a combination of both.

2.2 Grassington Moor and Cupola Mill

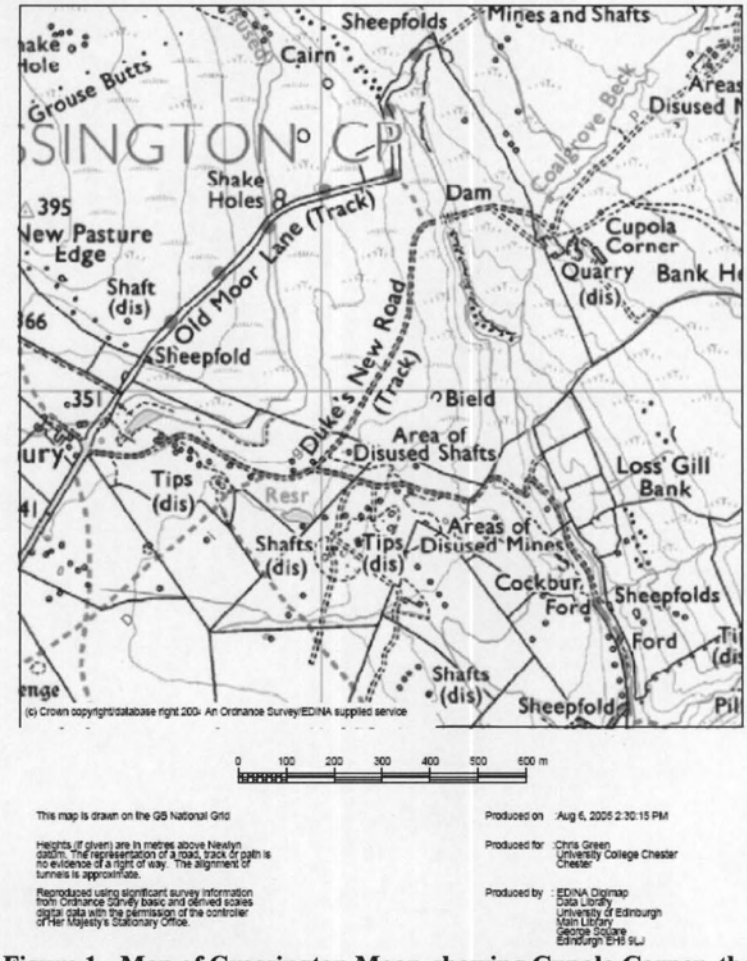


Figure 1 - Map of Grassington Moor, showing Cupola Corner, the site of Cupola Mill. The Grassington Moor interpretive trail roughly follows the line of the Duke's New Road from Yarnbury but taking in the area of disused mines to the south-east

2.2.1 Site and History[4]

There was little mining in the Grassington Moor area until the early 17th century after ownership of the mining rights fell into the hands of the 3rd Earl of Cumberland. Prosperity in the first half of the 18th century was followed by a decline as the current mines were exhausted. To stimulate new growth, the agents of the Duke of Devonshire, who by then owned the mining rights, developed from 1790 onwards a new system of drainage levels to drain existing mines and open up new veins for mining, and in the

[4] Taken from:
M.C. Gill, *The Grassington Mines* (Northern Mine Research Society: Keighley, 1993), p. 12
J. Morrison, *Lead Mining in the Yorkshire Dales* (Dalesman: Skipton, 1998), pp. 118-121
Clough, *Lead Smelting Mills*, pp. 76-77
National Monument Record (NMR) Number: SE 06 NW 15 *from* www.pastscape.org

1830s built the 'Duke's New Road', to facilitate transport into and out of the area, and especially to and from Cupola Mill. Cupola Mill was built in 1792 with a pair of reverberatory furnaces, another of which was added in 1830. In the 1850s an extended flue was built, containing two condensers and ending at a 60ft high chimney, the total length of the flue system being 5,140ft, making it one of the longest in the Dales. Mining and smelting output peaked in the 1850s before further decline set in. The last smelting activity at Cupola Mill took place in 1882. The area gained a new lease of life in the mid-20th century as waste heaps were exploited for the extraction of barytes for use in the chemical industry. Many features from this period are both alongside and superimposed on the remains of the original lead mining and smelting industry.

2.2.2 Initial Area Survey[5]

Grassington Moor is the site of the largest lead industry interpretation scheme in the Yorkshire Dales, so the visit covered this in addition to a detailed look at Cupola smelting mill.

The exhibition area at the Yorkshire Dales National Park Visitor Centre in the village of Grassington includes a couple of panels describing the lead industry in the area along with a small replica wagon containing sample ore and a book of mining reminiscences (Plate 1). The exhibit includes a schematic plan of the area of the interpretive trail that thematically links up, in terms of style and content, with the information boards on the moor.

At the top of Moor Road, about 2 km from Grassington, is Yarnbury House, formally the home of the Duke of Devonshire's mine agent. By a small parking area is the start of the '*Grassington Moor Lead Mining Trail*'. An information board on by the parking area, entitled '*A History of Grassington Lead Mines*' (Plate 2), gives a brief history of lead mining in the area plus an interpretive map showing the whereabouts of major mining and smelting activity plus the route of the mining trail with the major numbered points on the trail marked (Plate 3). The scheme was carried out by the National Park in conjunction with the Yorkshire Dales Millennium Trust using funds from the Millennium Commission, and appears to have replaced an earlier 'Mineral Trail' developed by the

[5] Visited on 19th March, 2005

National Park in conjunction with the Chatsworth Estate[6]. The board is repeated at the Cupola Mill site (Plate 11).

At each numbered point on the trail is a panel. Each panel succinctly sums up what is on view and gives a small graphic indicating what the scene might have looked like at the height of activity (Plate 4 and Plate 5). What the panels do not give is any detailed idea of the processes that were being carried out at a particular site, be that mining, dressing or smelting. Any layman ignorant of these processes, and that would probably be the vast majority of visitors, would be none the wiser. Most panels indicate which route to follow to the next one. However, some promised waymarking is not visible indicating that either that waymarking was planned in the interpretation scheme but has not materialised or that since the trail was opened it has been lost, obscured or removed. Added to this, one panel is missing entirely.

The actual state of preservation of the sites on show on the trail is extremely variable. Three sites, the Cockbur Powder House (Plate 6), the Condenser House above Cupola Mill (Plate 14) and the Cupola Mill chimney (Plate 17) are well preserved due in large part to the efforts of the Earby Mines Research Group. Other sites seem very much left to the elements and are showing definite signs of degradation with no obvious attempt at any kind of consolidation. The Wheel House at Beever Mine (Plate 5) and the High Grinding Mill (Plate 7 and Plate 8), for example, are in states of near collapse with original and later features tumbled against each other in a chaotic way. The Bouse Teams at Beever Mine also make an interesting comparison with the similar structures found at Bryntail Mine (Plate 75), which had been consolidated and preserved in the approved manner. These have very much been left as they were, clearly visible as to their function but with rubble obscuring much of the detail.

Cupola Mill[7], more than any other site on the trail, seems in need of improved interpretation. None of the features presenting themselves in front of the viewer is described in any detail, as can be seen from the only panel on the site of the mill (Plate 10). The general state of preservation of the fabric at Cupola Mill is also poor, especially when compared with the efforts that have been made at Grinton, Old Gang and Surrender Mills, as will be seen later, and also given the effort that has been put into presenting the

[6] Gill, *The Grassington Mines*, p. 11
[7] Also referred to by Clough as Grassington High Mill

area to the public via the interpretive trail (Plate 12 and Plate 13). The general impression is one of neglect and there seems to have been no serious attempt made to consolidate any of the structures.

The mill with its flues running up the hill to the chimney makes an impressive sight (Plate 16). The flues themselves are in a reasonable condition and for much of their length are still covered by turf. However, in a number of the roofed stretches, parts of the roof have collapsed and there is little evidence of any attempt to stop it getting worse (Plate 15). This is not helped by the fact that the interpretation trail leads directly up via the flue to the chimney and visitors are evidently often using the roof of the flue as the path. The flue chimney, according to the interpretive panel, was restored by Earby Mines Research Group in 1966 and 1971. What is difficult to gauge is how much is original and how much is reconstruction (Plate 17).

Plate 1 - Grassington Visitor Centre Lead Mining display

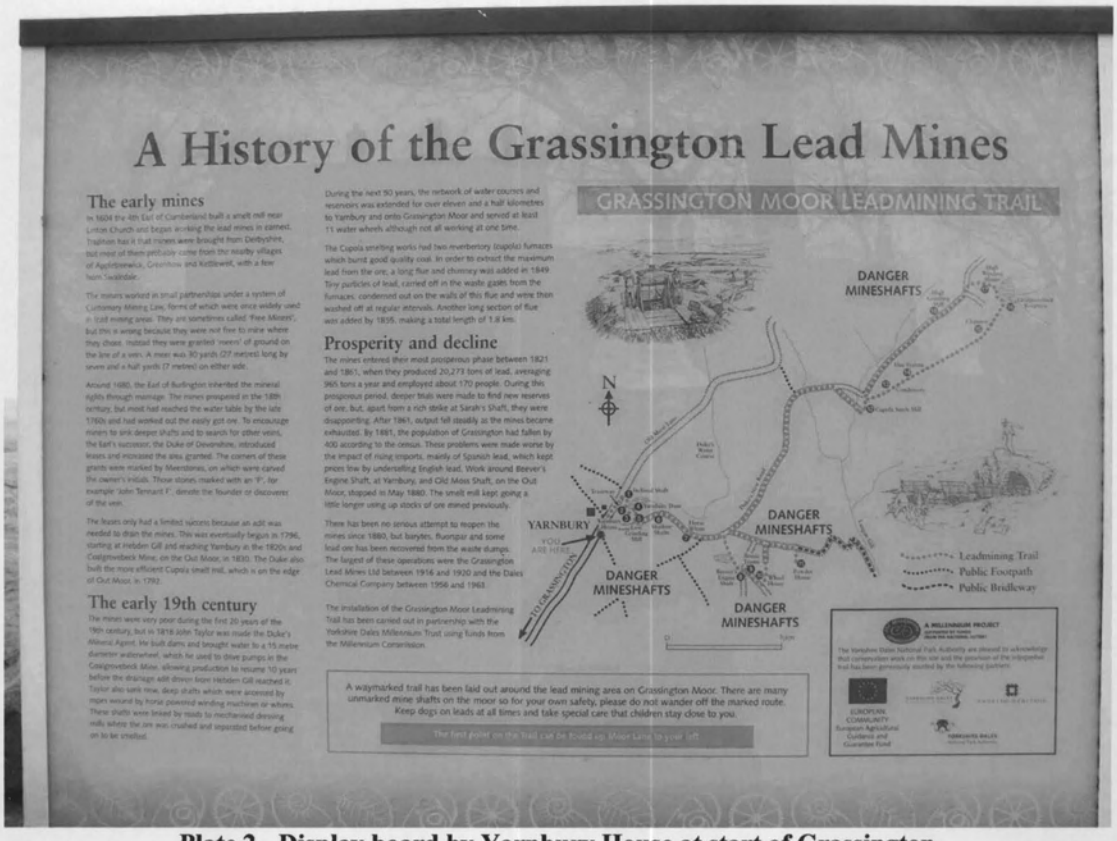


Plate 2 - Display board by Yarnbury House at start of Grassington Moor interpretive trail. An identical board is displayed at Cupola Mill

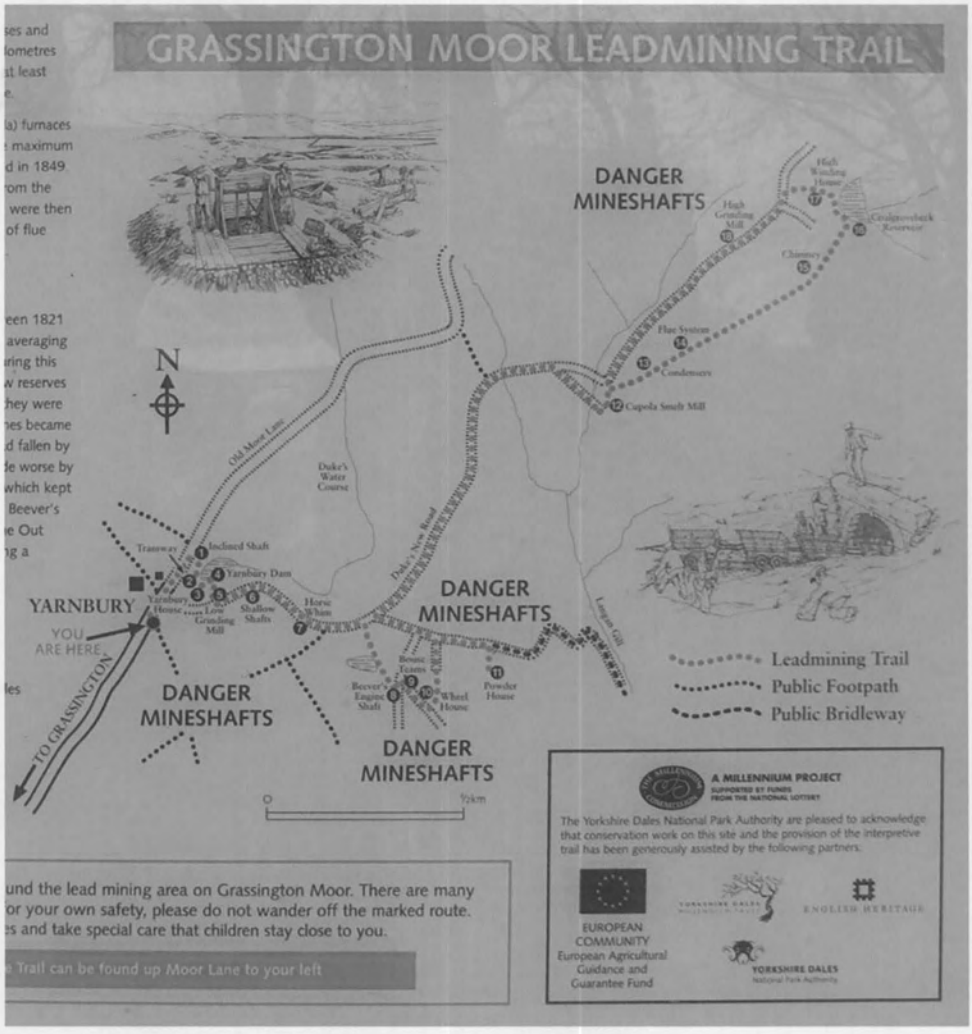


Plate 3 – Close up of the trail map. It also shows the contributors to the revamping of the trail

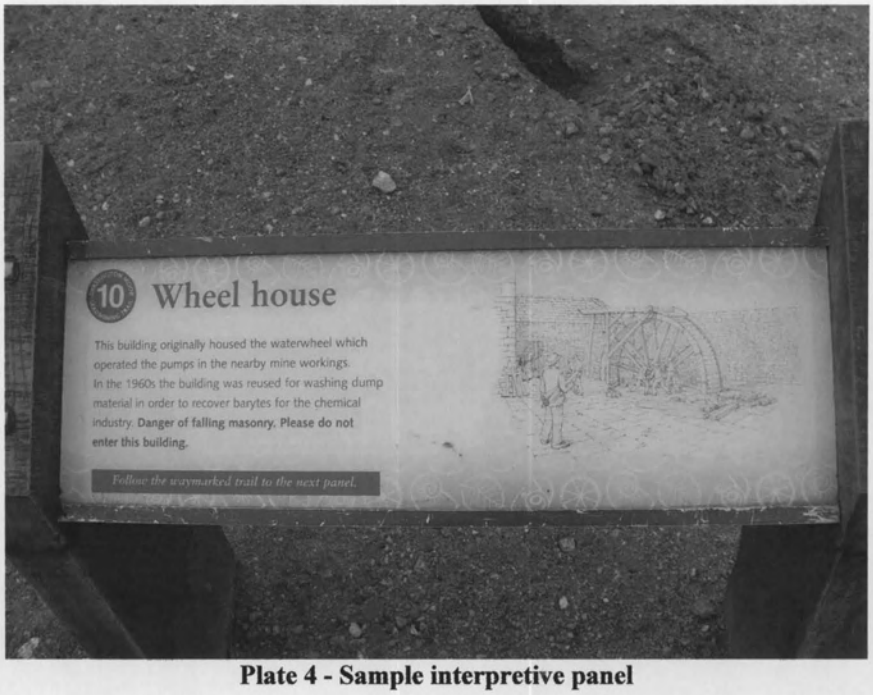


Plate 4 - Sample interpretive panel

Plate 5 - Panel in context. Note the state of repair of the Engine House in the background

Plate 6 - Cockbur Powder House. The 'Grassington Mines' book indicates this was preserved by the Earby Mines Research Group and a photograph in that book shows a plaque above the entrance[8]. The plaque is now missing (possibly replaced by the interpretive panel, possibly just lost).

Plate 7 - High Grinding Mill. The original mill structure is in the middle of the photograph with breezeblock walls from the 20th century barytes workings on either side

[8] Gill, *The Grassington Mines*, p. 55

Plate 8 - Further picture of High Grinding Mill showing collapsed wall in centre of structure

Plate 9 – Bouse Teams at Beever Mine

Plate 10 – Cupola Mill interpretive panel

Plate 11 - Entrance to Cupola Mill site showing information panel plus warning sign

Plate 12 - View of Cupola Mill showing general state of repair of site

Plate 13 – View along the line of hearths at Cupola Mill. Ore was loaded into bins from the top left and the actual hearths themselves ran along the line where the panel now stands. Note the fans of rubble

Plate 14 - The Condenser House above Cupola Mill. The continuation of the flue can be seen to the right leading up to the chimney

Plate 15 - Evidence of recent damage to flue

Plate 16 - General view of Cupola Mill site showing the mill itself and the main flue rising to the chimney on the horizon

Plate 17 - Chimney above Cupola Mill, as restored by the Earby Mines Research Group

2.2.3 Visual comparison with Clough

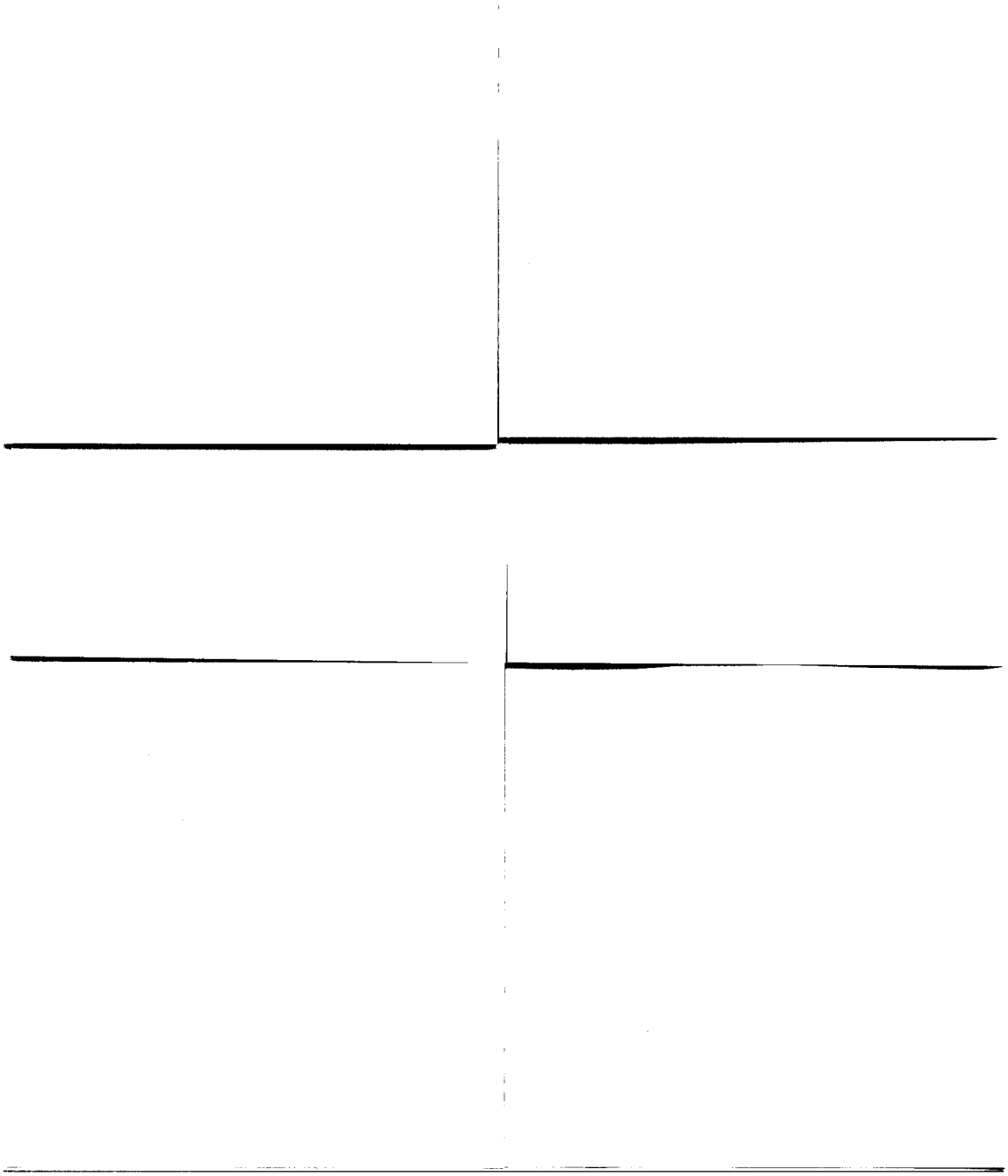


Figure 2 - Cupola Lead Smelting Mill as surveyed by Robert Clough[9]

[9] Clough, *Lead Smelting Mills*, p. 77

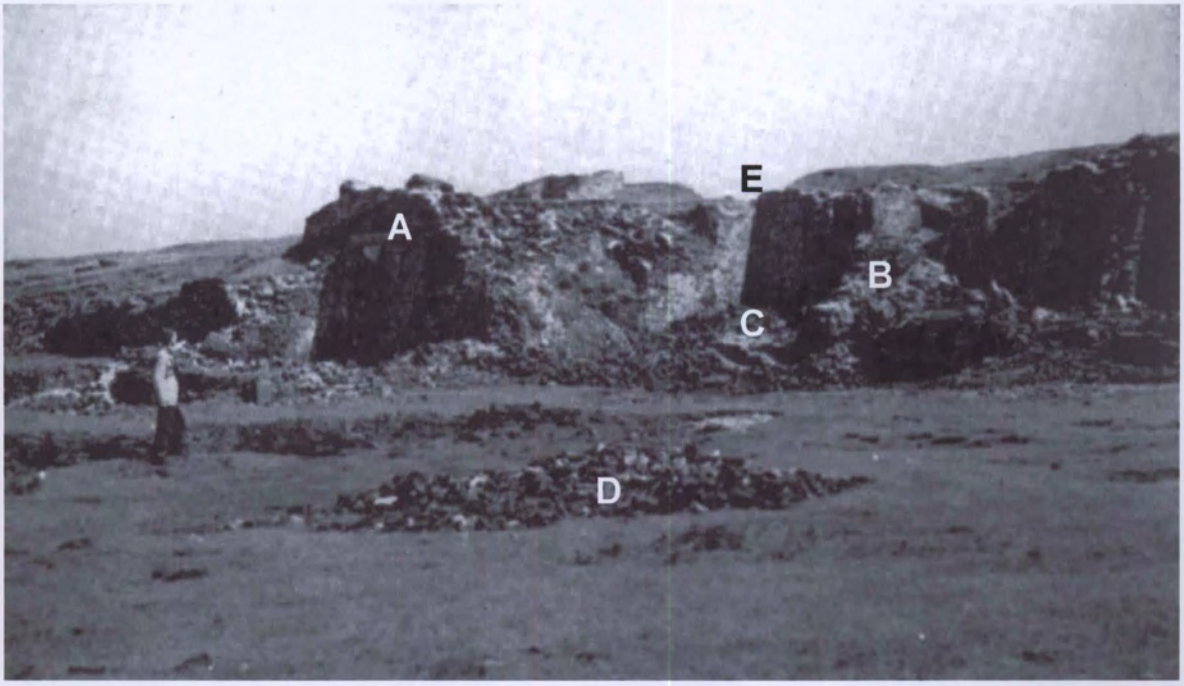


Plate 18 - Photograph of Cupola Smelting Mill taken by Clough in 1950[10]

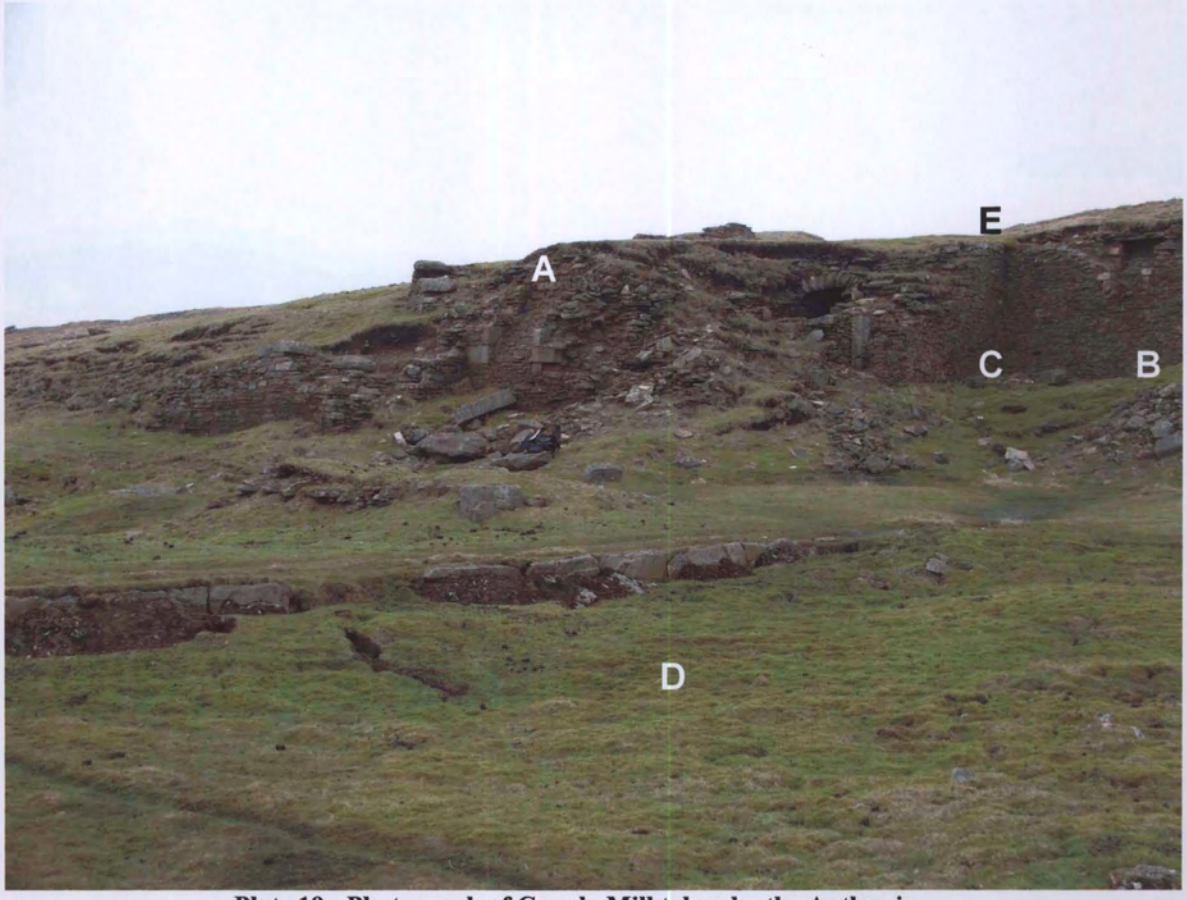


Plate 19 - Photograph of Cupola Mill taken by the Author in March 2005

[10] Clough, *Lead Smelting Mills*, p. 76

Clough only reproduces one small photograph of Cupola Mill in his book which makes direct visual comparisons difficult but not impossible. Also the photograph taken in March 2005 unfortunately does not quite pan far enough round to the left to pick up all the features shown by the Clough picture.

However, looking at the two pictures there are some obvious differences. The solid back wall of the ore store at A has now effectively gone and is now settling back into the slope of the land. Although it cannot quite be seen in the modern photograph, the ore store side wall at B, which was also the side wall of the flue from the left hand hearth, has now gone. The flue itself has disappeared completely from within the mill complex itself and is only now visible above the mill when it starts its journey to the chimney.

The feature at C in the older photo, which could be the back wall of the hearth, has gone in the later picture. The rubble that shows at D on the older photo has also gone in the later one, but whether this was a feature of any significance is possibly doubtful. One feature that does seem to be undiminished is the height of the wall at the corner of the ore store at E.

The general impression therefore, is not one of significant loss, such as will be seen at Cobscar Mill, but of a site gradually decaying into the landscape. Given the state of the mill in Clough's photo, there obviously had been significant decline in the 68 years since the mill had closed and it may be that the rate of decline has not been as rapid in the 55 years since Clough's survey.

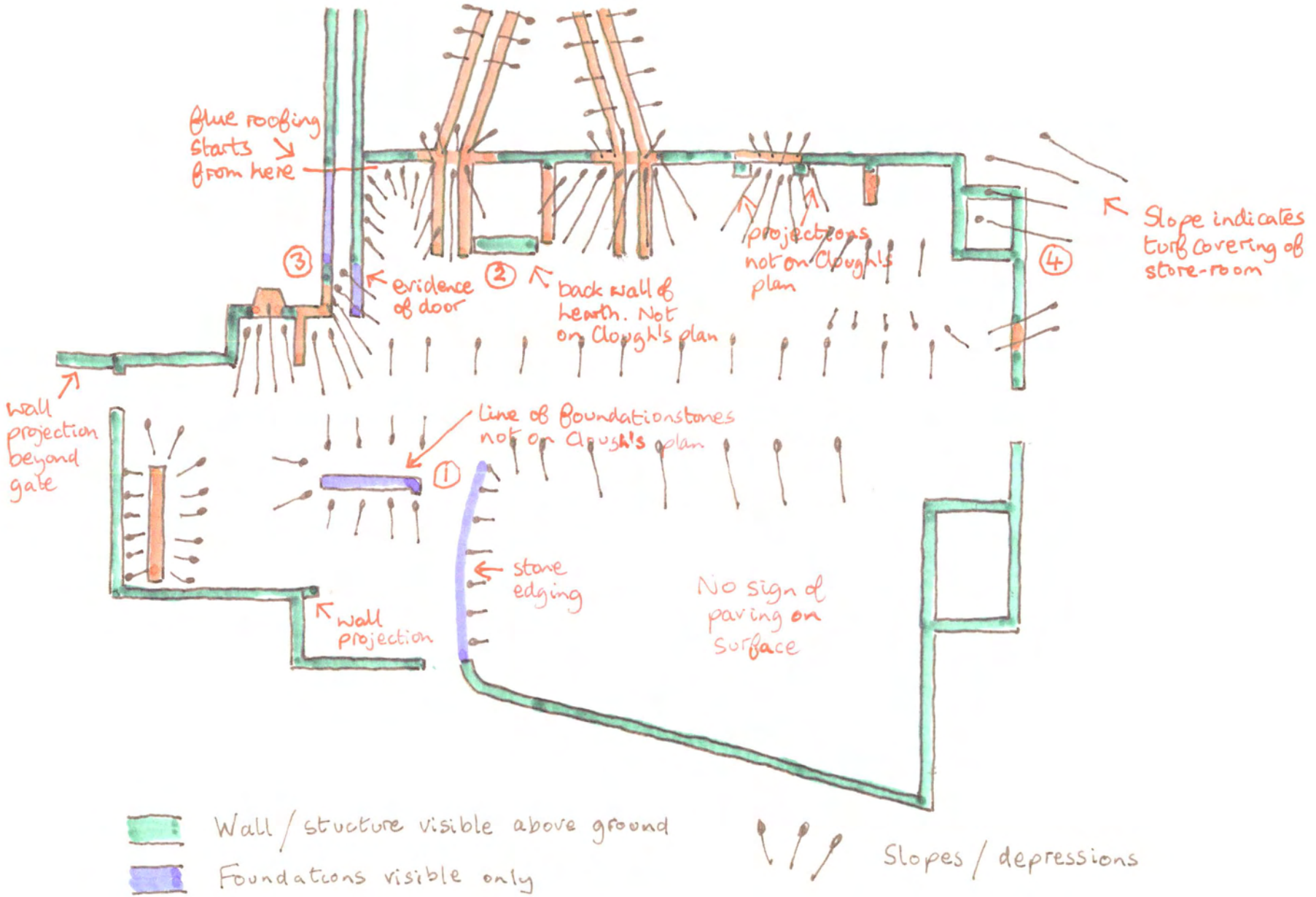
2.2.4 Detailed Survey – Plan comparison[11]

The detailed survey carried out 13th August, 2005. The exercise was not intended to be a full re-surveying of the site, but simply one, to ascertain the state of the structures on site compared to the *apparent* state of the structures shown in Clough's plan. To this end evidence was obtained of structures:

- With visible fabric still showing above ground (shown in green on the survey)
- Where only the foundations are now visible (shown in blue)
- Where the structure was either lost or completely covered in rubble (shown in red).

The survey also shows and slopes or hollows on the site. These are shown by means of hachures.

[11] Detailed survey carried out 13th August, 2005


Blue roofing starts from here
3
evidence of door
2
back wall of hearth. Not on Clough's plan
projections not on Clough's plan
4
Slope indicates turf covering of store-room
wall projection beyond gate
Line of foundationstones not on Clough's plan
1
stone edging
No sign of paving on surface
wall projection
Wall / stucture visible above ground
Foundations visible only
No evidence or hidden by rubble
Slopes / depressions

It soon became clear from being at the site, looking at the old photograph and comparing that with the present day photograph, that to a large extent Clough's plan was a mixture of actual evidence discovered on the ground and of conjecture based on that evidence. Though this plan carried no such admission, other plans in Clough's book do actually state that they are 'reconstructions', but none actually state which elements of the structures were extant at the time and which were projections.[12]

Bearing that in mind, there do still seem to be a number of features that have disappeared since Clough's survey. For example, the two flues running from the hearths are both marked on Clough's plan as running right down to the hearths, which to an extent is backed up by the feature shown at B on the photo. Both flues have now completely disintegrated leaving a fan of rubble coming down from the roadway above the hearths. This can be seen in Plate 13, where the left hand ore store can be seen in the left foreground, with a dip behind where the flue once ran. This photo also shows that the dividing walls that Clough marks between the ore stores are largely now missing. The sold lines that Clough shows as the line of the flues across the roadway and up the fill are also now gone, leaving only a slight depression on one of the flues. Substantial remains of the flues start further up the hill.

There are also a number of features that appear to be missing, badly surveyed, or misleading. A couple of features are in the first category. Above where Clough marks 'Position of Slag House', there are the foundations of a structure which may or may not be that house, but which Clough has not marked on his plan (Plate 20, marked 1 on overlay plan). Likewise, he marks a single line across the back of the hearths which might have been taken to indicate a conjectural line. However, there is one solid fragment of wall evident now (Plate 21) that one feels should have been marked on Clough's plan as solidly as other extant features (2). The main area where surveying has been done poorly is where the flue exits the roasting furnace and starts running up hill. There are a number of features that Clough has missed or measured wrongly here. The distance between the side wall of the ore store and the inner wall of the flue is, at 7 feet, a lot wider than Clough indicates. There is also evidence of a doorway either into the flue,

[12] Note that for both this and the Cobscar Mill survey, sample measurements were taken to verify the general dimensions of Clough's plans. As these and Clough's measurements were basically the same within a reasonable margin of error, they are not shown on the overlay to avoid over-cluttering the plan.

or into a space from which the flue runs, that Clough has not marked (3). As far as misleading surveying is concerned, Clough does not indicate that the store to the right of the hearths is in fact underground (Plate 22), as is also the case with the top end of the flue leaving the roasting hearth (4).

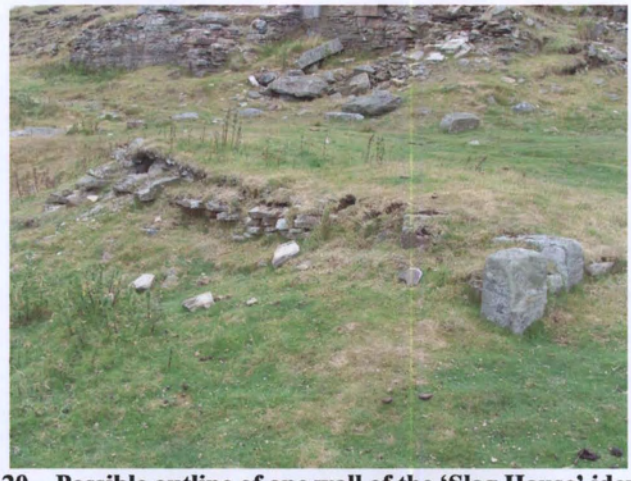


Plate 20 – Possible outline of one wall of the 'Slag House' identified on Clough's plan

Plate 21 – Back wall of one of the smelting hearths, not notated in Clough's plan

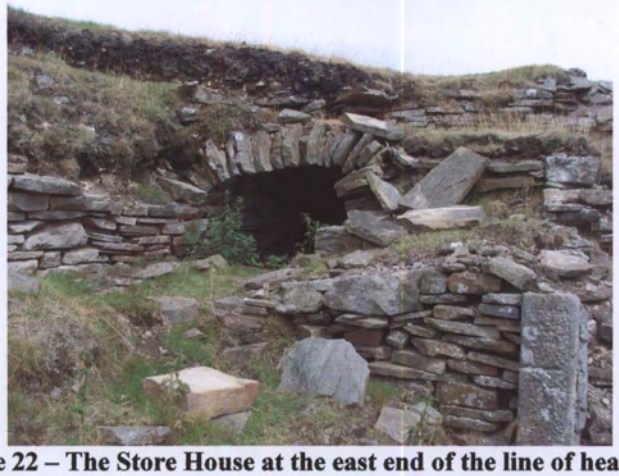


Plate 22 – The Store House at the east end of the line of hearths. Note the turf covering above – the store is in fact underground.

2.2.5 Site Summary

As far as the Grassington Moor area is concerned in general, the story is one of good practice and good intentions undermined by a lack of real care for much of the fabric of what is on display. The mining trail itself is well presented and gives one a view across time from the earliest bell-pits to the latest barytes workings from the 1950s and also attempts to cover the whole range of activities undertaken in the area. Where features have been preserved this has been done carefully and sympathetically. However, much of what is really important in the area still seems in a perilous state of repair, especially the area of the Beever Mine and the High Grinding Mill. This seems at odds with the thinking that produced the trail in the first place – should not consolidation and preservation have gone hand in hand with interpretation?

The survey of Cupola Mill shows it too follows this trend of gradual decay to an extent, but to how great an extent is unclear because of the sometimes confusing nature of Clough's surveying. Comparison of the photographs shows some decline in the area photographed, but that covers only part of the overall site. Clough was presented with a building that must already have suffered significant decay, but in his survey he seems to be trying to reconstruct that decay without following the basic good practice of marking what is actual and what is conjecture. At the other site re-surveyed, Cobscar Mill, he had a substantial building to work on, judging by his photographs and the plan as a result is a more reliable guide on which to work. With this site, however, it is far more difficult to draw conclusions based on Clough's work.

2.3 Grinton Mill

Figure 4 – Map of Grinton Smelting Mill. The village of Reeth lies to the north in Swaledale proper. Note the line of a hush to the north-west of the mill site

2.3.1 Site and History

Grinton Mill is situated in a side valley off Swaledale, about three miles from the village of Reeth. According to Clough, the mill was purchased by the London Lead Company in 1734 and worked until 1886, since when it has been used for storing and sheltering animals[13]. The current building dates from about 1820[14].

2.3.2 General Area Survey[15]

The mill is interesting in that it was one building that because of later agricultural use managed to keep much of its original fabric, including, crucially, its roof, and thus was an

[13] Clough, *Lead Smelting Mills*, p. 110
[14] Morrison, *Lead Mining in the Yorkshire Dales*, p. 132
[15] Visited on 31st July, 2005

obvious choice for conservation work initiated by the National Park in the 1980s. Indeed, the initial impression is that the mill and the associated peat house appear very well preserved. A sign on the walls of both structures states:

> 'THIS IS AN HISTORIC BUILDING, ONE OF FEW SURVIVING FROM THE LOCAL LEADMINING INDUSTRY. PLEASE DO NOT CLIMB THE WALLS OR DAMAGE THE BUILDING'

On close inspection there is much evidence of conservation activities that go beyond mere consolidation and of work done to present it to the public. Much new or repaired stonework is visible, especially under the eaves and there is evidence of the roof either being repaired or replaced (Plate 23). Guard rails have been put across the flue exiting from the mill (Plate 24) and are also visible on the entrance to an underground section of flue away from the mill site (Plate 28).

In the mill itself are two interpretation panels put up by the National Park, outlining the history of local lead mining and particulars of the mill, and briefly describing the conservation work done on the site (Plate 26)[16].

Within the mill the roof shows further evidence of repair with new timbers. By enclosing the space the roof creates a much better impression of the inside of a mill than other sites visited, such that the working relationship between the hearths, the input from the furnaces and output from the flue, is more clearly defined than in some of the more ruinous sites (Plate 25).

The roof also protects a remnant of the original wooden launder which would have taken water to power the waterwheel that once stood alongside the mill (Plate 27). The ragged broken end at the exit from the building suggests it is an original feature. On leaving the mill, the flue from the hearths ran up the hill past the peat house, though traces of it are lost until past the peat house. It also shows signs of active conservation, though in this environment there are signs that its fragility means more work may soon be needed (Plate 28).

[16] Morrison describes the care that was taken in the restoration: "Realising the building's importance, the National Park had all the slates removed in 1987, numbering each one, and repaired the stone and woodwork. The slates were then replaced in their original positions. The walls have been pointed and consolidated, to avoid further deterioration." Morrison, *Lead Mining in the Yorkshire Dales*, p. 109

The state of the mill and of the peat store, along with the continued presence of animals (Plate 30), shows that the buildings must have long been used for agricultural purposes and the interpretation panel confirms that this is the reason why it is in such a good state of repair. Clough's picture indicates that this was so in the 1940s. There is minor evidence of damage, for example to the outer windowsill of a mill window (Plate 29).

Plate 23 - Roof and wall of Grinton Mill showing evidence of new stonework abutting older work and new roofing

Plate 24 - Flue exiting mill with guard rails to front and side to protect public from dangerous drops

Plate 25 – One of the furnaces

Plate 26 - One of two interpretive panels in the mill building. This one gives details of the mill itself and the other gives general details of lead mining in the area

Plate 27 - The remains of the wooden launder in the mill building

Plate 28 - The flue above Grinton Mill with protective guard rails. Note how fragile much of the stonework is.

Plate 29 - Damage to stonework on a windowsill

Plate 30 – Interior of the peat house with a couple of the local residents

2.3.3 Grinton Mill – Visual comparison with Clough

Figure 5 - Grinton Lead Smelting Mill as surveyed by Robert Clough[17]

[17] Clough, *Lead Smelting Mills*, p. 111

Plate 31 - Photograph of Grinton Mill taken by Clough in 1955

Plate 32 - Photograph of Grinton Mill taken by Author in July 2005

Visual comparison of the photo taken by Clough and the situation now show that of all the sites visited this is one where the fabric generally looks in as good if not better shape than before. This is especially apparent in the side wall of the mill where the roof tiles above are in a better state of repair now than previously (A). Further up the hill the entrances to the two section of flue look more clearly defined in the new photo suggesting some consolidation work has taken place (B). The only obvious sign of deterioration is the damage already mentioned to the windowsill in the nearer of the two windows on the side wall of the mill (C).

2.3.4 Site Summary

Grinton Smelting Mill is a good example of a site where the happenstance of a continued use for the buildings has enabled considerable survival of interior features of a smelting mill that at other less fortunate sites have vanished with the elements. The comparison with Cobscar Mill a few miles away, which was in operation until a later date but which now requires an effort of will to recreate in the mind what it might have looked like, is striking. It must have been an obvious choice for consolidation and preservation work and for presenting properly to the general public. The success of this is evidenced by the fact that the site appeared, at least on the day of the visit, to be attracting far more visitors than any of the other sites visited for this study in the Yorkshire Dales. This is despite the fact that it is situated some way from a minor road where there is limited parking, and that it is not visible from that road and so less likely to attract the casual visitor.

2.4 Old Gang Mill and Surrender Mill

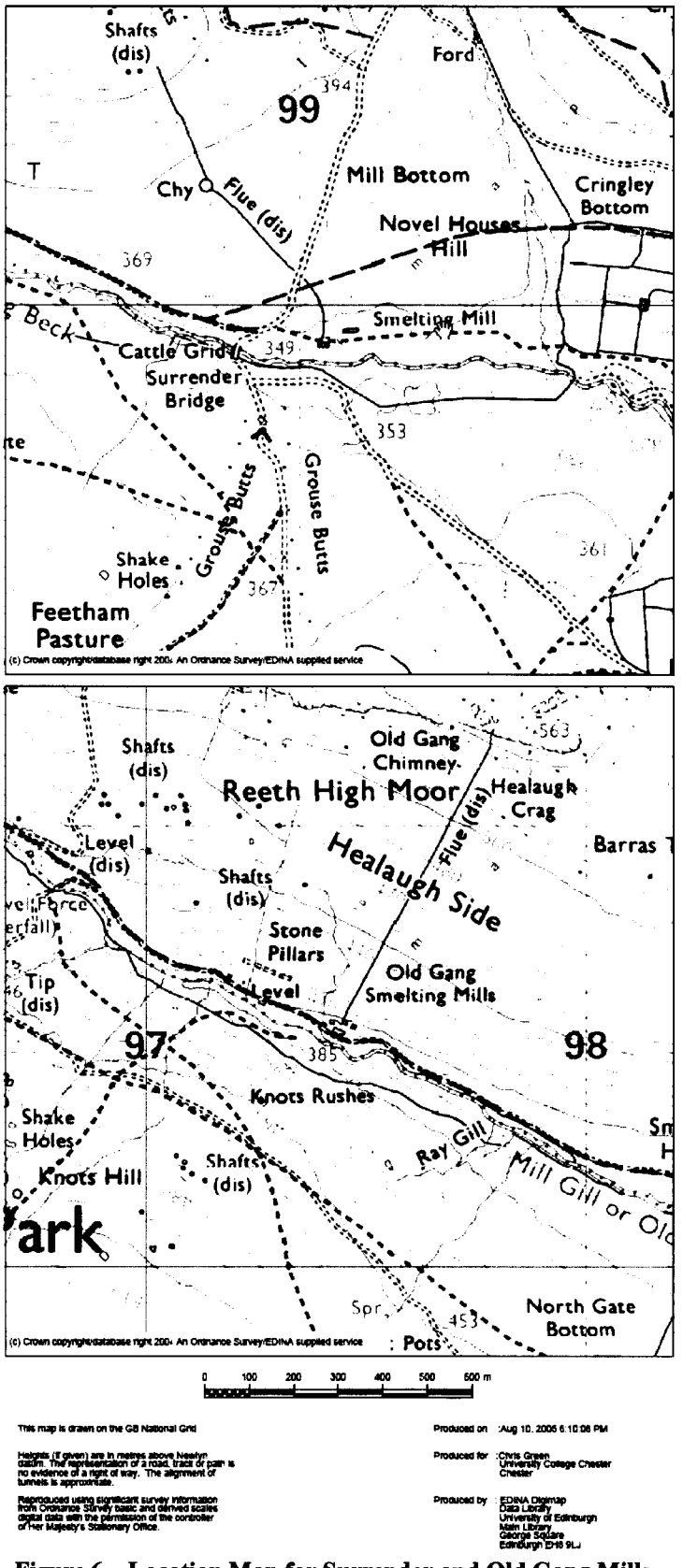


Figure 6 – Location Map for Surrender and Old Gang Mills. Surrender Mill is about 1.5 km south-east of Old Gang Mill further down Mill Gill. Swaledale itself is a short distance to the south.

2.4.1 Site and History

The Surrender and Old Gang smelting mills sit near to each other in a valley crossing the minor road leading out of Swaledale from Low Row to Langthwaite. The original Surrender Mill probably dates from the 18th century but was replaced by the current building in 1839 after it had fallen into disrepair. This mill operated until final closure in 1881[18]. Smelting was carried out in the vicinity of Old Gang for centuries before the current mill was built in 1790. Calcining furnaces were added in the early 19th century and a reverberatory furnace in 1872. Smelting finished probably around 1898 and the furnaces were dismantled in 1933[19]. The mills are both Scheduled Ancient Monuments and are both now situated on the route of the popular A.Wainwright 'Coast-to-Coast' footpath[20], ensuring a constant stream of passers-by.

2.4.2 General Area Survey[21]

At the point at which the minor road crosses the valley in which the mills are situated there is a fair amount of car parking available. However, there are no signs pointing to either mill. The only interpretation at both mills is signs indicating their status as Scheduled Ancient Monuments (Plate 35). At both mills there are signs of active consolidation work in support of this conservation but no more interpretation of the site. For example, at Surrender Mill this is evident at the tops of some of the interior walls (Plate 36) and at Old Gang Mill the area where the hearths were situated has been cleared of rubble and the walls further consolidated (Plate 37).

The flues leading away from the mills show varying levels of survival. Immediately on leaving the mill itself, Surrender's flue is still covered in parts with its original stone slabs (Plate 38), but further uphill it is occasionally still a turf-covered arched tunnel, sometimes a roofless stone trough but more often a rubble-filled depression (Plate 39). Where a section of arching has survived it is often close to collapse (Plate 40). The Old Gang flue is generally more substantial and indeed creates a spectacular effect as it dives down steeply through a line of crags from the chimney to the mill. However, a number

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[18] Clough, *Lead Smelting Mills*, pp. 116-118
[19] *Ibid*, pp. 118-124
[20] Though not a formally designated long-distance footpath, the Coast to Coast walk, following a route of Wainwright's devising, runs from St Bees in Cumbria to Robin Hoods Bay in North Yorkshire and is extremely popular. This means that there will always be a constant stream of hikers passing these two sites.
[21] Visited on 2nd April, 2005

of grouse butts have been built into the structure to the total detriment of the general effect (Plate 41). Both flue chimneys are in a total state of collapse.

Plate 33- Surrender Mill from up the valley

Plate 34 - The Old Gang Mill from above. The Coast-to-Coast path follows the track between the mill and the stream

Plate 35 - The only interpretation on the Surrender Mill site. The same was true of the Old Gang site.

Plate 36 - Signs of active consolidation on the tops of the interior walls in Surrender Mill

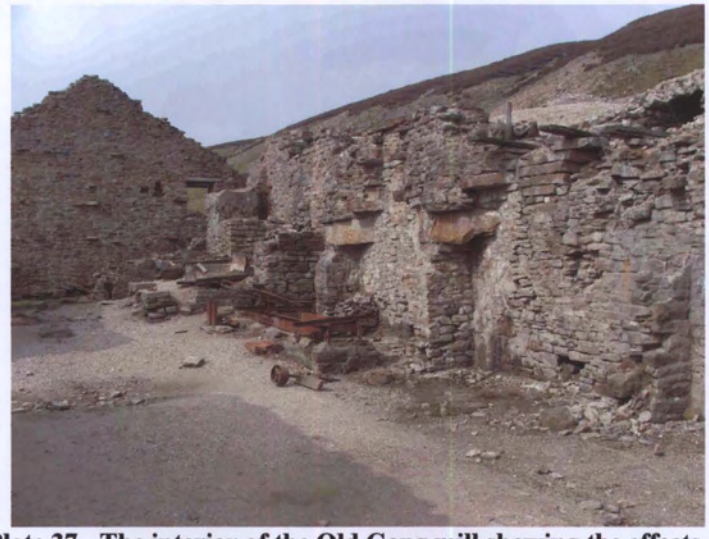


Plate 37 - The interior of the Old Gang mill showing the effects of recent consolidation work clearing the site of rubble

Plate 38 - The flue leading away from the hearths still has its roof intact in parts

Plate 39 - The flue leading uphill from Surrender Mill. Note the different states of preservation of the flue

Plate 40 - This fragment of the flue roof above Surrender Mill appears to be being held together by willpower rather than anything else

Plate 41 - Reuse of the Old Gang flue as a grouse butt. There are number of these at regular intervals down the hill

2.4.3 Surrender Mill – Visual comparison with Clough

Figure 7 - Surrender Lead Smelting Mill as surveyed by Robert Clough[22]

[22] Clough, *Lead Smelting Mills*, p. 119

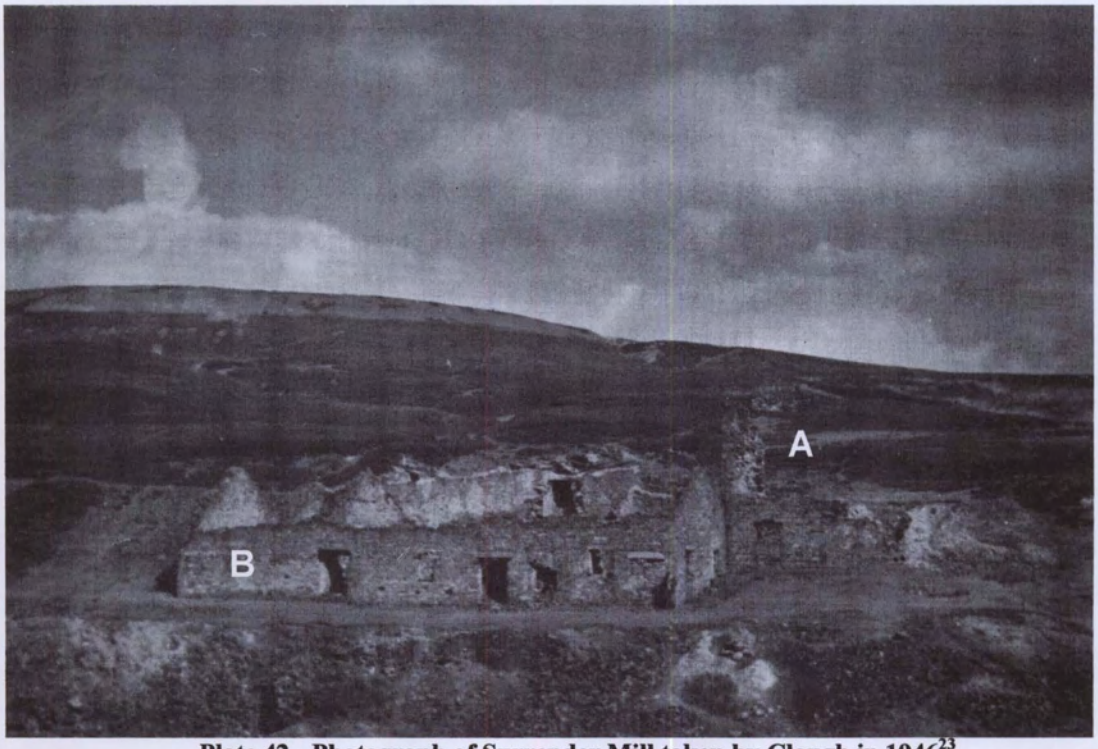


Plate 42 - Photograph of Surrender Mill taken by Clough in 1946[23]

Plate 43 - Photograph of Surrender Mill taken by the Author in April 2005

[23] Clough, *Lead Smelting Mills*, p. 117

Comparison between Clough's photograph and the one taken for this study shows that there has been some loss of fabric. This is especially evident with regard to the chimney at the corner of what is marked on Clough's plan as the calcining furnace and also the furnace structure itself which appears to have degraded considerably (A). The remainder of the standing walls appear to be of roughly the same height and it appears some reconstruction may have taken place, for example the door at the left hand end is not in Clough's photograph (B), or if it is it was filled in and has been reopened. Interestingly, Clough's plan shows it as a doorway. The lines of the top of the exposed walls appear smoother in the later photograph which is probably an indication of the consolidation activities that have taken place.

2.4.4 Old Gang Mill – Visual comparison with Clough

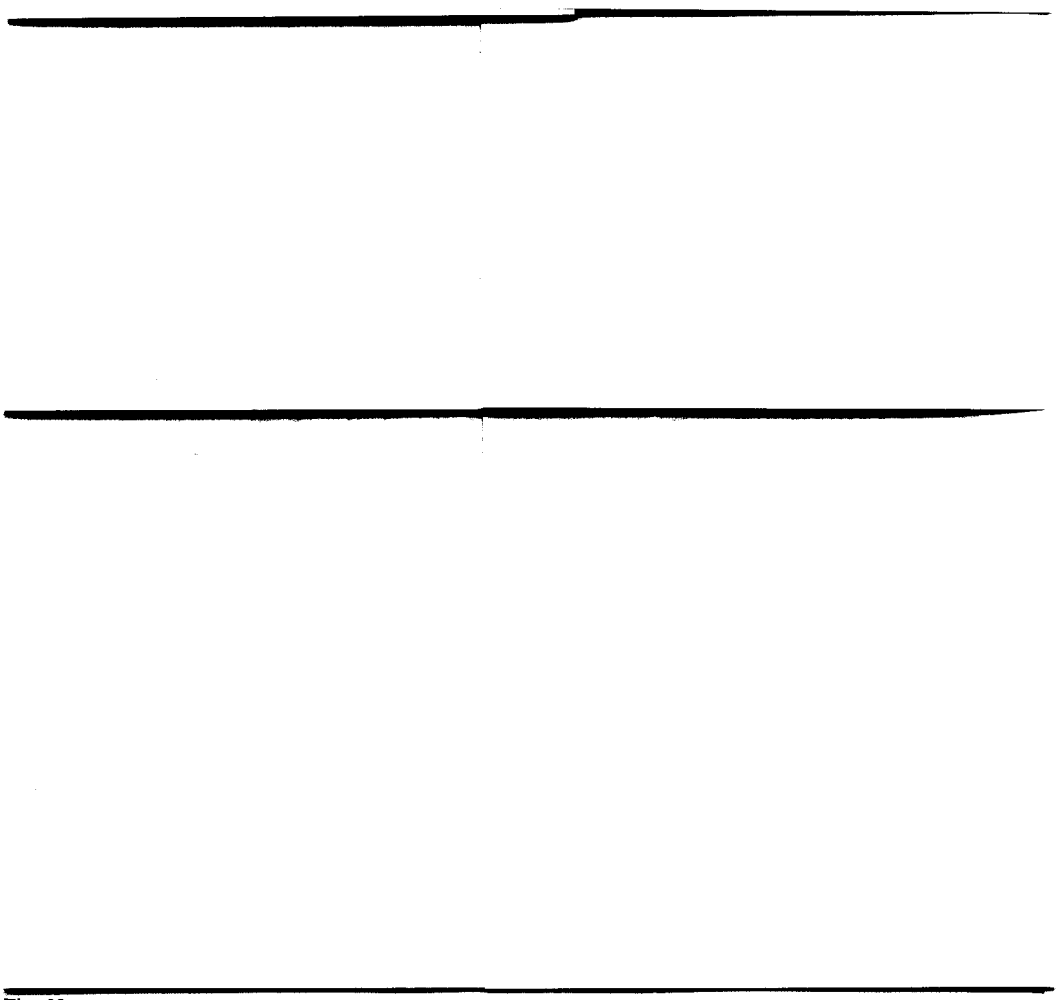


Figure 8 - Old Gang Lead Smelting Mill as surveyed by Robert Clough[24]

[24] Clough, *Lead Smelting Mills*, p. 123

Plate 44 - Photograph of Old Gang Mill taken by Clough in 1946[25]

Plate 45 - Photograph of Old Gang Mill taken by the Author in April 2005

[25] Clough, *Lead Smelting Mills*, p. 120

The present day photograph shows that considerable degradation has taken place since Clough's photograph was taken. The store room at A, that was intact with roof beams still showing in the old photograph, has lost its front wall and any semblance of a roof. The doorway at B has lost its lintel, while at C both the doorway and its framing wall have gone. The complex of flues at D have lost a great deal of their definition and the building at E, not marked on Clough's plan, has effectively disappeared apart from the two end walls. Although there has been active consolidation done on this site by the National Park the evidence therefore shows that much damage was done between the 1940s and the remedial work undertaken recently.

Plate 46 - Photograph of the Old Gang Mill Peat Store taken by Clough in 1946[26]

Plate 47 - Photograph of the Old Gang Mill Peat Store taken by the Author in April 2005

[26] Clough, *Lead Smelting Mills*, p. 121

Up the hill from the mill is the Peat House, another structure photographed by Clough in his book. Comparison of the two photos shows a reduced end wall at A as well as a completely new wall running across the house in the immediate foreground (B). It is not clear whether this wall is a reconstruction of an original feature.

2.4.5 Site Summary

These two mills have been the subject of active conservation work by the National Park during the late 1980s and early 1990s as well as detailed archaeological research such as a study of Old Gang in the early 1990s that essentially looked to question the findings of Clough and establish a strict chronology of buildings on site[27]. As mentioned, they are also situated on the line of one of the most popular long-distance walking routes in the North of England. These factors combined with their Scheduled Ancient Monument status should ensure that they maintain a high profile and a continuing appreciation of their worth. This is in direct contrast to the next site visited, in one of the more remote lead mining landscapes of the Dales.

[27] D. Cranstone, *Excavations at Old Gang Smeltmill: An Interim Report*, from ed. L. Willies & D. Cranstone, *Boles and Smeltmills* (Historical Metallurgy Society Ltd: Matlock Bath, 1992), pp. 28-31

2.5 Cobscar Mill

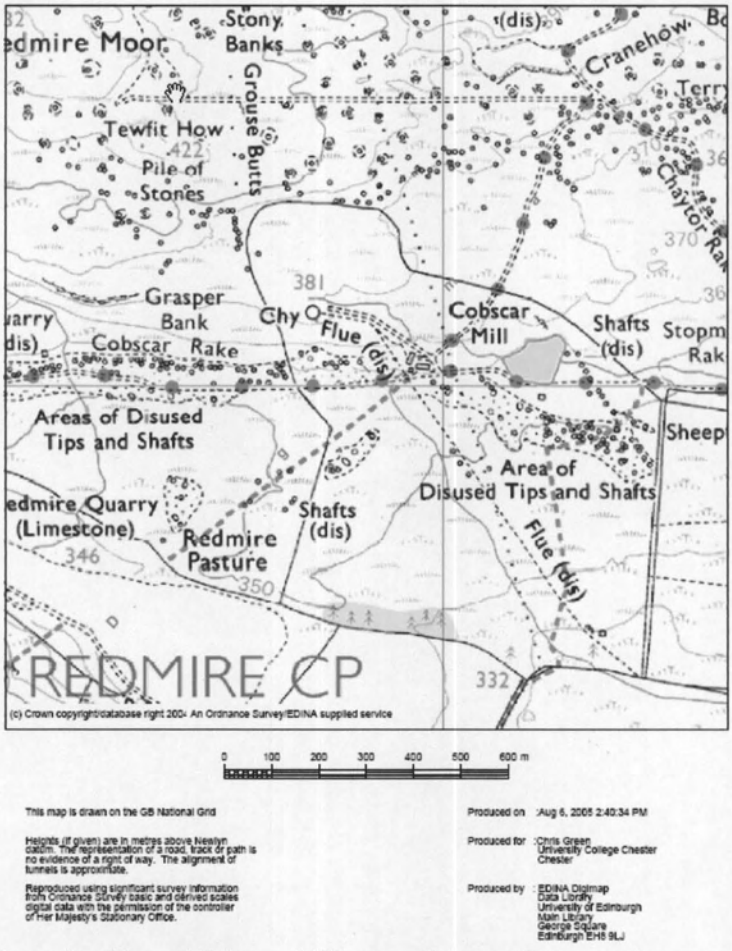


Figure 9 – Map of Cobscar Mill area. Cobscar Rake can be seen to the west. The village of Redmire is off the map to the south-west.

2.5.1 Site and History

Cobscar Smelting Mill lies about 2km north west of the village of Redmire above Redmire Scar and within sight of the castle at Castle Bolton. Between the mill site and the scar is now a large limestone quarry, but the route of a right of way suggests that there was a direct path up from Redmire village. Clough states that the mill was constructed by Lord Bolton in the mid-18th century to serve the mines along Cobscar Rake. He suggests that smelting finished around 1890, since when the mill has been in a continuous process of decay, exacerbated by military operations in 1943 which appear to have resulted in the loss of the mill's roof, thus accelerating this process[28]. The National Monument Record gives a specific date for the mill of 1762[29].

[28] Clough, *Lead Smelting Mills*, p 93-94
[29] NMR Number: SE 09 SE 15 *from* www.pastscape.org

2.5.2 Initial Area Survey[30]

Cobscar Mill is approached from the village of Redmire uphill through a line of limestone crags and across a limestone quarry. From the hillside below only the chimney is visible and from a distance this looks in a good state of preservation. A line of shallow pits, indicating the route of the Cobscar Rake, runs up to the mill site. In terms of visitor information, there is no indication on this approach or on site as to what the remains are.

Close up, the flue chimney is a solidly built structure though there is no obvious hint that there has been any real attempt at consolidation, judging by the gaps in the pointing. Indeed, this apparent stability may only be skin-deep with dangerous looking fault lines running through the tower (Plate 48). The chimney entrance is well-preserved and it is possible to walk in and see the internal structure of the chimney which appears to be in reasonably robust shape (Plate 49).

The flue shows no signs of repair or consolidation. In places fragments of the side walls remain but in others there is just a rubble-covered mound (Plate 50). Nowhere is the roof of the flue preserved.

The immediate environs of Cobscar Mill are neither particularly interesting nor attractive, consisting mainly of mining waste and the workings of the limestone quarry. In two visits not a single other visitor was encountered. It feels that this is not an area that would ever be popular with visitors and hikers, even with (or maybe because of) its proximity to Bolton Castle.

The mill itself is in a sorry state. While the plan of the mill is still apparent, though not overwhelmingly so in some areas, many of the walls have decayed to rubble and where walls remain, many are in a precarious state. Given that this mill was not in the list of those given special attention by the National Park[31], it was an obvious candidate for a detailed survey and comparison with Clough's findings.

[30] Visited on 29th May, 2005
[31] See Appendix C

Plate 48 - Cobscar Mill chimney with fault running diagonally through middle of structure

Plate 49 - Interior of chimney

Plate 50 - Section of flue leading down from chimney to Cobscar Mill

2.5.3 Visual comparison with Clough

Figure 10 - Cobscar Lead Smelting Mill as surveyed by Robert Clough[32]

[32] Clough, *Lead Smelting Mills*, p. 92

Plate 51 - Photograph of Cobscar Mill taken by Clough in 1946[33]

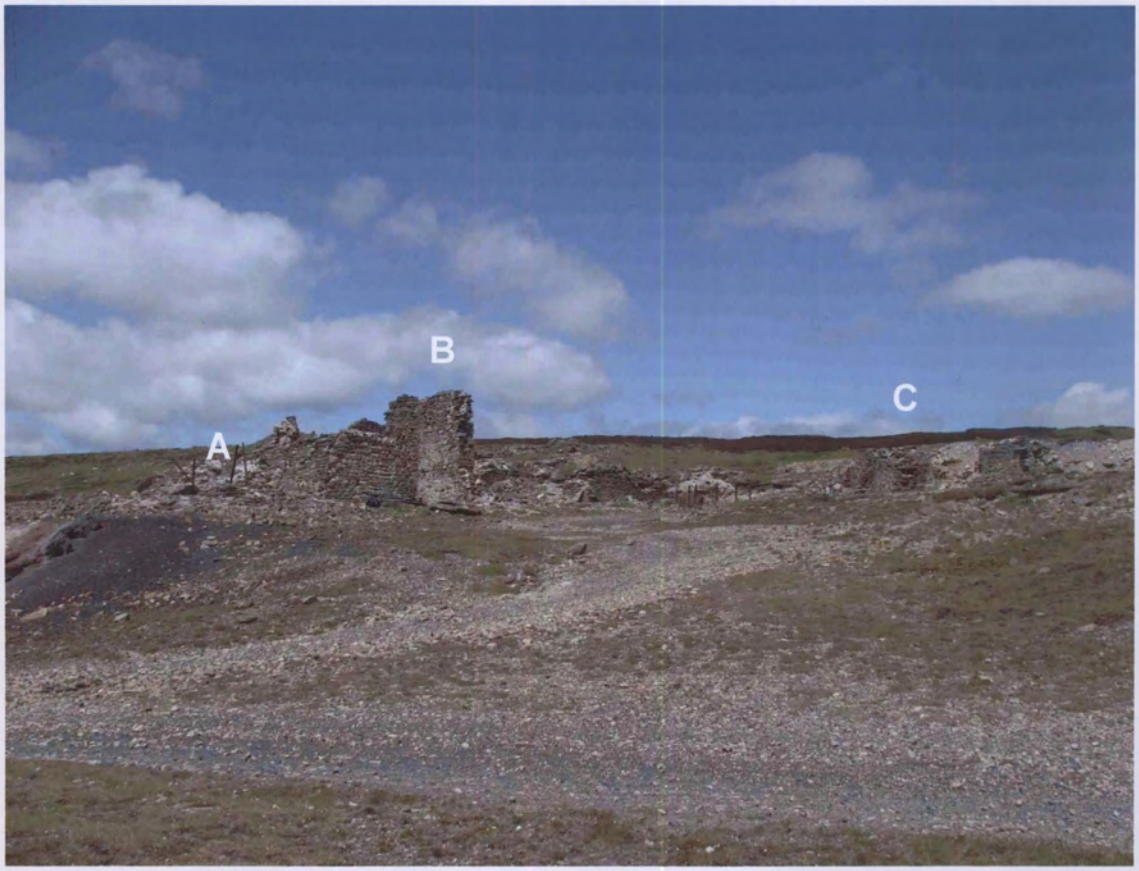


Plate 52 - Photograph of Cobscar Mill taken by the Author in May 2005

[33] Clough, *Lead Smelting Mills*, p. 94

Clough talks about 'partial demolition' of the mill due to military activity in 1943. If we are to believe his book, the picture reproduced from his book was taken in 1946, i.e. after the war (Plate 51). He describes this mill as 'roofless and decaying' but the photograph shows that substantially more remained at that time, even after partial demolition, than is evident on the ground today. Comparing Plate 51 with Plate 52 shows how much has been lost. What was in 1946 still recognisably a building is now a crumbling ruin on which the accelerating processes of decay are all too apparent. The mill is the building to the left of the pictures and comparison shows that the left-hand end, which housed the ore hearths and the mill office on Clough's plan, has lost all but a fragment of its enclosing walls (A). Plate 53 shows this clearly. Exposure to the elements has meant that little is left of the 'ore hearths' except foundations, some rubble and remnants of two metal A-frames.

Elsewhere, the roof has disappeared completely – indeed no walls remain above even the original ground floor door level apart from a fragment of wall between the bellows room and the slag hearth (B). What remains is often fragile and close to collapse (sees Plate 54). Apart from the metal remains of the ore hearth no evidence remains of any of the mill equipment shown on Clough's plan, e.g. the bellows, the waterwheel or the slag hearth, though a few fragments of metal and wood remain scattered around the site.

The building shown to the right on Clough's picture, which, though not marked on Clough's plan was at one end of the fuel store, has disappeared completely apart from a few low fragments of wall (C).

In summary, much of the architecture is in a pretty perilous state, and shows no sign of any care or attention having been lavished on it. Plate 55 sums up the general appearance of the site with rubble everywhere, walls collapsed and individual structures (in this case the platform at the back of the roasting hearth), discernible but fast disappearing.

Plate 53 - Remains of ore hearth. In Clough's photograph of 1946 this was a complete room. Now only the back wall remains. The arched opening behind the right-hand metal A-frame leads through to the bellows room.

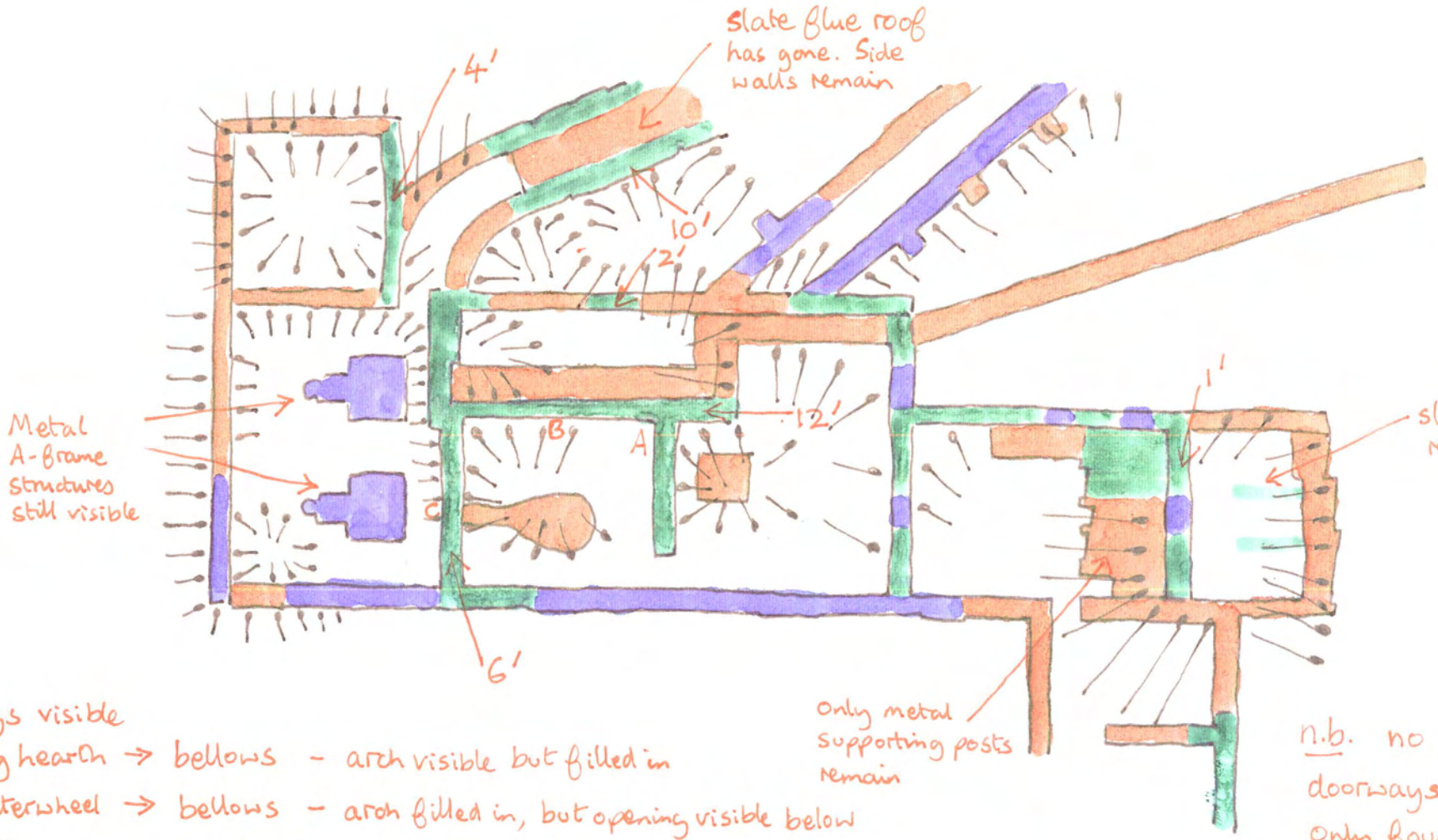
Plate 54 - A sample of the state of repair of the mill walls.

Plate 55 - Remains of platform at back of roasting hearth

Plate 56 - The route of the flue leaving the smelting hearth

2.5.4 Detailed Survey – Plan comparison

The detailed survey of the site was carried out on 31st July, 2005. The conventions used during the survey are described for the Cupola Mill survey (see 2.2.4).



Openings visible

A Slag hearth → bellows – arch visible but filled in

B Waterwheel → bellows – arch filled in, but opening visible below

C Bellows → ore hearths – Small arched opening visible

n.b. no complete doorways remain, only foundations

Slopes/depressions

Wall/structure visible above ground

Foundations visible only

No evidence or hidden by rubble

6' approximate height above ground level of point marked (in feet)

The re-surveyed plan of the site shows clearly how much the structure of the mill has deteriorated in the 57 years since Clough's original survey. Yes, the example of Cupola Mill has shown that Clough could be inventive in what he showed on a plan, but given the photographic evidence in Plate 51 there was obviously a substantial proportion of the mill still standing when Clough did his survey in 1948, and the plan appears at face value to reflect that.

The re-survey shows that the core of the mill building, the area around the bellows, waterwheel and slag hearth, is in the best state of preservation. However, even here the height of the remaining standing walls never exceeds approximately 12 feet, and is generally about half that. The most obvious deterioration in the site is at either end of the structure. At the south-west end of the building, the line of the outer wall of the office and ore hearths is for the most part indefinable beneath the rubble as it slips down the slope towards the stream below. Similarly at the north-east end, the ore store running down into the roasting furnace has largely merged in the general slope of the bank running down from above.

The walls of part of one of the flues leading up from the hearths are still standing, but the flagstone capping shown in Clough's plan has disappeared and what is left of the walls is variable in height and solidity as can be seen in Plate 56. The flue running out from the slag hearth is in a worse state of repair with the foundations visible only in places. Clough shows on his plan the launder bringing the leat into the waterwheel, borne on stone piers. While the launder itself might have been an example of Clough reconstruction, no evidence of the piers themselves remains.

Internally, the mill equipment is not evident other than in the ore hearths, but the re-survey seemed to show that the slopes and depressions in the various room did correspond roughly to the positions Clough gave to these pieces.

2.5.5 Site Summary

Comparison with Clough shows that Cobscar Mill has deteriorated significantly since Clough's survey. He suggests that that process was already underway in the use of the past tense in the following: "Prior to its partial demolition in 1943, this was one of the

most complete and interesting of the Yorkshire mills."[34] However, the photographic evidence combined with the evidence of Clough's plan and textual description show that the rate of decline must have continued apace since Clough's time until what we see now is only a shadow of what even he saw. The irony is that the smelting mill chimney at Cobscar is still essentially complete and indeed is one of the best examples still standing in the National Park. Even here though the effects of time are obvious and it may not be long before it starts to disintegrate.

2.6 Section Summary

Only a limited number of the sites described in Clough's book could be visited in the time available for this study. Based on this sample, however, it is evident that with one exception there has been clear evidence of deterioration of the fabric of the smelting mills since Clough's investigations. His plans, due to the idiosyncrasies of their design, are of limited help in determining this deterioration, but strong evidence comes from comparison of the photographic evidence. This is especially true of the Cupola and Cobscar Mills. What is unclear, without further evidence in the form of plans from the time of plans or photographs, is the extent to which the fabric has deteriorated since active consolidation activities began in the 1980s, instigated in large part by the National Park authority. This would need to be the subject of further investigations.

[34] Clough, *Lead Smelting Mills*, p. 93

3 Lead Industry conservation and the policy framework within the Yorkshire Dales National Park

3.1 The foundation of the National Parks

The 1949 *National Parks and Access to the Countryside Act* was the culmination of a process that had begun nearly 20 years previously as a result of a groundswell of public opinion on the need to both preserve and encourage access to the certain of the more beautiful areas of the English and Welsh landscapes. Various enquiries and sub-committees had met through the 1930s but it was not until the return of a post-war Labour government that the idea finally began to assume reality. A white paper was published in 1945 as part of the Labour party's post-war reconstruction plans and a committee formed to prepare for legislation[35]. The final act enabled the setting up of National Park authorities for specific areas of natural beauty and gave them specific aims which were clarified by the Environment Act 1995 as follows:

1. To conserve and enhance the natural beauty, wildlife and cultural heritage of the area;
2. To promote opportunities for the understanding and enjoyment of the special qualities of the National Park by the public.

This Act also stated that in pursuing these purposes:

> "The authority shall seek to foster the economic and social well being of local communities within the National Park, but without incurring significant expenditure in doing so... and in co-operation with local authorities and public bodies whose functions include the promotion of economic and social development within the area of the National Park".[36]

The first National Parks to be created under the act were designated in 1951. Unlike the American model, where National Parks are centrally managed and run very much as the normal idea of a park with no local residents other than park workers and visitors, most land within British National Parks remains in private ownership and the parks themselves

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[35] from the Council for the National Parks website: *History of the Parks – 50th Anniversary of the National Parks and Access to the Countryside Act*, http://www.cnp.org.uk/50th_anniversary.htm

[36] Yorkshire Dales National Park Authority (NPA), *The Yorkshire Dales – a national park (education file)* (YDNPA: Grassington, 2005), p. 2

encompass a significant local population, many in small towns and villages, all still going about their normal everyday occupations.

3.2 Yorkshire Dales National Park – basic responsibilities

The Yorkshire Dales National Park was created in 1954 and covers an area of 1,773 square kilometres of North Yorkshire and Cumbria. Over 20,000 people actually live and work within the Yorkshire Dales National Park, emphasising the point made above that this is very much a working park, not a static park. The park receives over 8 million visitors a year[37]. The National Park itself only owns a small fraction of the land under its jurisdiction. Over 99% of the land is owned privately[38]. The Yorkshire Dales National Park Authority (NPA) contains representatives from the elected local authorities and has certain controls and responsibilities that would normally devolve down to those authorities. For the purposes of this study the following are most significant:

- To conserve the character of the landscape;
- To work with landowners to safeguard the conservation interest of their land;
- To conserve the archaeological heritage, maintain the Historic Environment Record (HER)[39] and administer the Listed Building requirements;
- To promote understanding and appreciation of the area through education and interpretation programmes.[40]

All of these are significant when looking at issues regarding conservation of the lead heritage in the Dales. Importantly the NPA is the statutory planning authority for the National Park and must approve almost all proposals for new and changed building or land use[41].

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[37] from the Yorkshire Dales NPA website, *About Us* http://www.yorkshiredales.org.uk/about.php4
[38] *Ibid*, p. 3
[39] The Historic Environment Record was previously the Sites and Monument Record (SMR), and is the list kept by local authorities of archaeological sites and buildings within their area.
[40] Yorkshire Dales NPA website, *About Us*, p. 3
[41] from the Yorkshire Dales National Park Authority website, *Planning Services* http://www.yorkshiredales.org.uk/planning-services.php4

3.3 Scheduled Monuments - the statutory framework and the role of English Heritage

Overlying the National Park responsibilities are the normal governmental rules and regulations, most important of which in the context of this study are the planning guidelines around Scheduled Ancient Monuments. It is important to note here the difference between scheduling and listing. If a building is or can be made usable, it is 'listed' and the emphasis is on continuing use and if this is not possible then it is 'scheduled' and a different set of protections apply[42]. The difference is therefore essentially between architectural and archaeological protection. The sites described within this study, because of their current state of preservation, fall into the scheduled category.

Extracts from the Planning Policy Guidance for scheduled monuments, produced by the Department of the Environment[43], are shown in Appendix B. The first extract defines the requirement to maintain a schedule of monuments, which at the local level within the National Park is the responsibility of the NPA to maintain via the HER[44]. Appendix B.2 emphasises the protection that is offered to scheduled monuments, while B.3 makes the obvious point that simply protecting a site on paper does not guarantee its continued survival and that if required maintenance plans should be drawn up to prevent deterioration of the site's fabric.

All the extracts also point out the role that English Heritage can play in the conservation process. They are the Government's statutory adviser on applications for scheduled monument consent, and as such all listed building consent applications should be referred back to it by local planning authorities such as the National Park. They 'encourage' local authorities to appoint conservation officers to ensure integration of conservation in the planning process, which has proved important in the case of the Yorkshire Dales. They also provide grants and advice with regard to both the repair and interpretation of industrial buildings, again important in regard to this study.[45]

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[42] from the English Heritage website, *The Schedule of Monuments* http://www.english-heritage.org.uk/server/show/conWebDoc.2436

[43] Now re-designated since the publication of these guidelines as the Department for Environment, Food and Rural Affairs (DEFRA)

[44] The document actually refers to the Sites and Monuments Record but see footnote 39.

[45] English Heritage, *Industrial Archaeology – a policy statement by English Heritage* (English Heritage: London, 1995), pp. 10-13

3.4 The development of planning and conservation strategies

As stated above the NPA is the statutory planning authority for the area. Given also its remit to both conserve and promote the Park's natural and cultural heritage, it takes a holistic approach to the determination of strategy for the future direction of the park. The industrial element of that is but a small part. It therefore regularly produces plans and policy documents that range from the long to the short term and from covering the park as a whole to covering individual areas. These plans and policies are then reflected both in the work that is carried out or supported on the ground, and what is presented and promoted to the general public, both visitors and residents. The published plans are also very much the product of a coordinated approach with all interested parties, especially the local population, consulted at various stages throughout the planning process and meetings of the various committees, including the planning committee, spread throughout the park and publicised on the NPA website.

Many of these planning and policy documents are published either in full or in summary form on the National Park website. At the top level there is a document such as *Yorkshire Dales – Today and Tomorrow*[46], that takes the Dales as a whole and sets out the basic aims, principles and objectives with regard to the long term management of the park, in the case of this document over the period 2000 to 2005. The objectives are essentially high-level but they set the agenda for more detailed plans to be constructed. As far as industrial archaeology is concerned that are a few references that are of relevance, such as commitments that the built heritage and historic environment "will be conserved and enhanced for current and future generations as part of the cultural heritage of the Dales"[47], and objectives to "survey, interpret and protect the historic environment of the Dales"[48] and "identify buildings and features which are 'at risk' and prioritise conservation action on them"[49].

The management plan then feeds annual plans that detail how the NPA has performed financially and set specific priorities and targets for the next three years. The latest of these is the *Best Value Performance Plan 2005/6*[50]. Under the heading "Conservation of

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[46] Yorkshire Dales NPA, *Yorkshire Dales Management Plan – "The Yorkshire Dales – Today and Tomorrow"* (undated, obtained from http://www.yorkshiredales.org.uk/publications.php4)
[47] *Ibid*, p. 6
[48] *Ibid*, p. 10
[49] *Ibid*, p. 21
[50] Yorkshire Dales NPA, *Best Value Performance Plan 2005/6* (YDNPA: Grassington, 2005)

the Cultural Heritage", this includes such actions as "complete survey of all publicly-accessible Scheduled Ancient Monuments"[51], "develop and implement a programme of practical conservation work on four monuments, including Kettlewell smelt mill"[52] and "publicly launch the 'Out of Oblivion' website"[53].

Another output from the long term management plan was a series of local action plans, drawn up in consultation with local residents, that took the priorities listed within the management plan and turned them into specific actions that could be carried out in the areas of questions. The National Park website contains copies of four of these, all dating from 2001, including ones for Upper Wharfedale[54] and Wensleydale[55]. Though these were both areas of intense lead mining activity, neither include any specific proposals for any actions related to it apart from one reference in the Wensleydale plan to recording the "heritage of underground mines" [56]. The main concerns of the local population, understandably, were more on an improved environment, a better transport infrastructure and footpath network and better policing.

3.5 Other relevant bodies

As well as working with bodies such as English Heritage in line with the Planning Policy Guidance summarised above, the nature of National Parks and of their funding means that the NPA has to work closely with others in order to achieve its objectives. This means not only landowners and other local residents, but also, in the context of this study, other trusts and voluntary bodies that can provide resources, expertise, funding or just basic enthusiasm to help with the conservation of historic industrial relics.

Two such bodies have been active in sites chosen for this study. The first body is the Earby Mines Research Group which was formed in 1945 by a group of potholers in order to explore the underground lead mines in Yorkshire. These activities led them to an appreciation that the surface structures of the industry were fast deteriorating and they

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[51] Yorkshire Dales NPA, *Best Value Performance Plan*, p. 33
[52] *Ibid*, p. 35
[53] *Ibid*, p. 34. See Appendix E.1
[54] Yorkshire Dales NPA, *Upper Wharfedale Area Actions Plan* (2001, obtained from http://www.yorkshiredales.org.uk/publications.php4)
[55] Yorkshire Dales NPA, *Wensleydale Area Actions Plan* (2001, obtained from http://www.yorkshiredales.org.uk/publications.php4)
[56] *Ibid*, p. 19

took it upon themselves to "rescue, record and preserve" any remains that they could[57]. This also led in 1971 to the setting up of the Museum of Yorkshire Dales Lead Mining in Earby itself. Their publicity says that this contains a wide range of lead mining relics from the Yorkshire Dales, but it has been closed for refurbishment for some time and at the time of writing remains closed. Over the years they have been active in helping restore a number of structures associated with lead mining in the Yorkshire Dales. The two structures that are relevant to this study are two encountered on Grassington Moor, the Cockbur Powder House and the Smelting Mill Chimney above Cupola Mill, along with its associated flue system.

The second body whose activities were encountered is the Yorkshire Dales Millennium Trust (YDMT) which was founded as a charity to "identify and carry out conservation projects which target the special features of the Dales"[58]. They work in partnership with other organisations, such as the NPA and English Heritage, and to date have spent over £20 million and now employ 10 staff. The particular project relevant to this study is that relating to the refurbishment of the interpretation scheme on Grassington Moor and the building of an associated stone walkway intended to protect against damage to the smelting mill flue[59]. Nearly 500 individual projects are listed on their website. Of these, four are connected to the lead industry. In addition to the project mentioned, there are consolidation and repair activities at Grinton Mill, Bolton Parks Mine near Castle Bolton, and Sir Francis Mine near Gunnerside. Welcome though this work is, it is obvious from the published list of projects that the main priority for the trust is very much community-based and environmental work[60].

3.6 Industrial conservation within the National Park

The Planning Policy Guidance on Scheduled Ancient Monuments recognises the need for the authorities responsible for the monuments to appoint conservation officers to

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[57] from Earby Mines Research Group website, http://www.ex.ac.uk/~RBurt/MinHistNet/EMRG.html
[58] Yorkshire Dales NPA, *The Yorkshire Dales – a national park*, p. 4
[59] The Grassington Moor site survey did not find this walkway and indeed comments on the erosion still caused to the flue by not having a well-defined path alongside (Section 2.2.2). Information received from the Trust however implies the work was actually done. Given that the flue system on this section of Grassington Moor is the most extensive in the Yorkshire Dales, it could be that the walkway was simply missed, in which case a number of other visitors must be missing it as well. A further visit would be required to check on this.
[60] The projects are listed on the Yorkshire Dales Millennium Trust website, http://www.ydmt.org/cgi-bin/projects.cgi

integrate conservation activities with the planning process. The Yorkshire Dales National Park therefore has a full-time Archaeological Conservation Officer to carry out these duties, a post currently filled by Robert White. From examination of his published work, White is very much an expert on industrial landscapes, particularly in placing them in a specific historical context. This expertise is illustrated by his book *The Yorkshire Dales – A Landscape Through Time*, which takes the Dales landscape from distant geological eras through to the present day, showing how landscapes have developed and overlain each other through the ages. The work contains a whole chapter devoted to the lead industry plus another on other local industries and concludes with analysis of the way forward in terms of conserving the traces of past landscapes that are left. It concludes with the following pertinent paragraph:

> "Conservation of the landscape, and the archaeological and cultural features within it, should not mean fossilisation. The Yorkshire Dales is not a museum but a working landscape that has always been in a constant state of change and, in changing, will create the historic environment of the future. The challenge for conservation is to balance often conflicting demands and to protect the landscape for present and future generations, while not forgetting that its character is a result of its exploitation and utilisation by our ancestors."[61]

White forwarded for this study a policy document, produced in the early 1990s, that tries to put this challenge into action with specific reference to the lead industry. Extracts from this document are reproduced in Appendix C. The paper posits a suggested programme for the "identification, recording, management and interpretation of the surviving remains of the lead industry in the Yorkshire Dales", and outlines:

- A programme of surveying of relevant sites to ensure their details are at least on record;
- How statutory protection could be extended to cover more than the then current list of scheduled sites;
- Which further sites could be the subject of emergency consolidation;

[61] R. White, *The Yorkshire Dales – A Landscape Through Time* (Great Northern: Ilkley, 2002), p. 117

- Where interpretation schemes could be developed, with specific reference to the need to replace the Grassington Moor interpretation scheme.

In a contemporary article, White gives more details on the work he thought at the time would need doing. This included consolidation of the smelting mill on Grassington Moor, where he considered that "despite the deterioration that has since occurred, the stabilisation of the surviving remains is both desirable and practicable"[62]. He also emphasised the fragility of the remains of the lead industry in the park:

> "...a balance needs to be struck between public access and interpretation with its inevitable effect on increasing visitor pressure and the long term conservation of what are still, in part, very fragile monuments in a working landscape."[63]

3.7 The current position – an assessment

The various surveys carried out for this study along with other investigations have helped to develop an assessment of the extent to which White's wishes of over a decade ago have come to fruition in the intervening years.

There are many positive developments. Further sites have joined the list of scheduled monuments, including the one site visited that was most in need of it, namely Cobscar Mill. The interpretation scheme at Grassington Moor was renewed, though as the site survey shows, the new scheme is already showing signs of wear and tear. There has been a large amount of activity in getting the Historic Environment Record up to date and accessible to the general public via the 'Out of Oblivion' website. A brief pamphlet on lead mining in the Yorkshire Dales has also been published and is available in the park visitor centres[64]. Through his published work and continued role as conservation officer, White has also ensured that preservation of the cultural heritage of the lead industry remains, if not at the centre of policy, at least on the agenda.

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[62] R. White, *Protecting the remains of the Lead Smelting Industry in the Yorkshire Dales National Park*, from ed. L. Willies & D. Cranstone, *Boles and Smeltmills* (Historical Metallurgy Society Ltd: Matlock Bath, 1992), p. 66

[63] *Ibid*, p. 66

[64] See Appendix D.1

However, in response to questions put to him as part of this study, White does hint that all is not what it could be[65]. In 1992, he highlighted the need for consolidation work on Grassington Moor. This has still not been done in 2005, basically because finances have not been made available, though it remains an intention to carry out the work. Some planned consolidation work has been completed, such as the Sir Francis Mine work done in co-ordination with the YDMT, which was completed in 2005, though this was originally planned for completion in 2000. Given that it now has scheduled status, Cobscar Mill should, according to the Planning Policy Guidance, be a candidate for work being undertaken to prevent further deterioration to its fabric. However, White says that no such work is currently planned by the NPA. Another problem cited by White in getting such work done is simply the availability of contractors to carry out the work, given the booming state of the residential construction market in the area. Interestingly, another issue around conservation work was highlighted by the reply to a query for information to the Earby Mines Research Group. Major projects in which they have been involved in the past, such as the Grassington Moor project, are, in the opinion of the Group's secretary, unlikely to happen in the future simply because of the problems of providing insurance for carrying out such work, given the threat of "legal action by third parties who may be foolish enough to injure themselves on or around the work sites"[66].

A major problem, maybe unsurprisingly, is therefore the provision of money to carry out conservation or interpretation work. The NPA has a myriad number of calls on its finances, of which preserving the fabric of the lead industry is but a minor one. 75% of their income comes from central government with the inevitable uncertainty as to future levels of funding that entails. To help remedy this, the NPA are increasingly looking to generate their own income through car parking charges and the sale of publications and souvenirs in their visitor centres, as well as going into partnership with bodies such as the YDMT to help fund activities[67].

The financial statement below, illustrates the problem. Any activities connected with the lead industry would be only a part 'Conservation of the Cultural Heritage' budget which in itself is only a small part of the total expenditure of the NPA. That proportion was also

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[65] Robert White's responses are from an e-mail dated 25th August, 2005
[66] Extract from letter to author by J.D. Carlisle, Hon. Secretary of the Earby Mines Research Group, dated 4th May, 2005
[67] Yorkshire Dales NPA, *The Yorkshire Dales – a national park*, p. 4

estimated to drop for both 2004/5 and 2005/6 with a rise not predicted until 2006/7. Given these restrictions though, the fact that the requirements for future work are so well understood by people in a position of influence such as Robert White is important, and means that the lead industry, and its relevance to the history of the landscape of the Yorkshire Dales, should remain visible on the agenda of the NPA for the foreseeable future.

	Expenditure	Actual 2003/04 £'000	Estimate 2004/05 £'000	Budget 2005/06 £'000	Planning 2006/07 £'000
A	Conservation of the Natural Environment	641.3	725.7	822.8	778.3
B	Conservation of the Cultural Heritage	345.3	298.8	306.0	452.2
C	Recreation Management	2,012.9	2,599.7	2,420.1	2,270.5
D	Promoting Understanding	1,634.1	1,668.1	1,764.8	1,717.0
E	Traffic & Transport	269.7	174.2	104.0	93.5
F	Rangers, Estate Teams & Volunteers	458.1	536.6	508.3	504.9
G	Development Control	756.9	958.2	829.2	721.8
H	Forward Planning	446.5	564.8	383.8	374.0
I	Corporate & Democratic Core	802.7	723.8	481.1	451.7
J	Training & Development	39.7	45.6	50.0	51.5
	Matched Funding for grant bids	-	-	-	-
	Capital Charges inc in A-J	-656.6	702.0	680.7	654.2
	Total Gross Expenditure	**6,750.7**	**7,593.5**	**6,989.4**	**6,761.1**

Figure 12 – Financial Statement for the Yorkshire Dales NPA[68]

[68] Yorkshire Dales NPA, *Best Value Performance Plan 2005/06*, p. 38

4 Other approaches outside the Yorkshire Dales National Park

4.1 Introduction

As shown in the previous section, the Yorkshire Dales National Park, through its Archaeological Conservation Officer, has developed a unified approach to the identification and preservation of sites of particular interest within its boundaries. Having studied a number of sites within the National Park to see how the resultant policies are applied in practice, it would be useful to examine a number of lead mining and smelting sites in other parts of the country that exhibit different contexts in the way they are owned and managed. As stated in the introduction, sites were chosen to fit under the following headings:

- Local authority control. Two examples were chosen, one under the control of a unitary authority, Minera Mining Museum, run by Wrexham Borough Council, and one of a county council, Snailbeach Mines, run by Shropshire County Council;
- National statutory authority control. Bryntail Mine in mid-Wales was chosen, managed by Cadw, the Welsh historic environment agency;
- Heritage trust control. Here, the Nenthead Mining Museum in Cumbria was chosen, a site operated by the North Pennines Heritage Trust with the assistance of a number of other funding bodies. This is also important as the only site visited where admission was charged for entry;
- Voluntary bodies. Two sites were chosen in and near the Peak District National Park maintained by the Peak District Historic Mines Society, namely the Magpie Mine near Bakewell, and the Stone Edge Mill near Chesterfield, both in Derbyshire.

Visits were made to each of these sites and general impressions gained of the way in which relics of the lead industry are being consolidated, preserved and presented back to the public.

4.2 Minera Mining Museum[69]

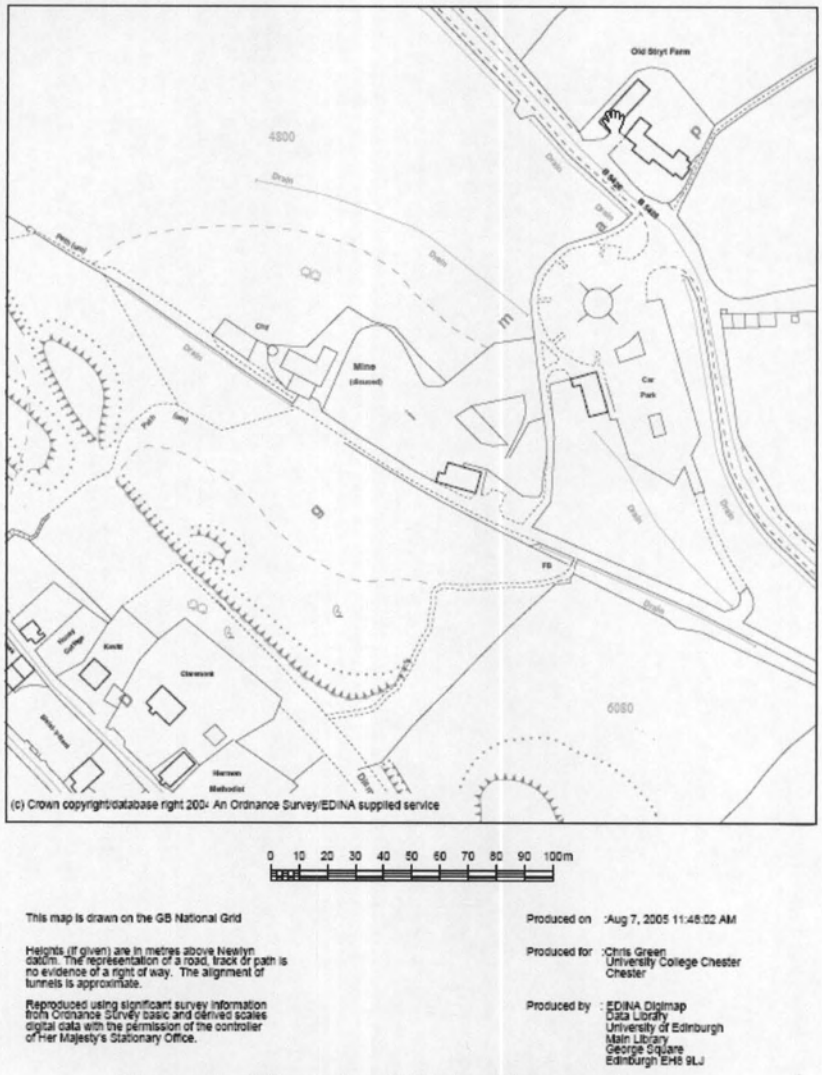

Figure 13 - Minera Lead Mining Museum site map

4.2.1 Site Visit

The Minera Lead Mining Museum was chosen as an example of a site managed by a local authority, namely Wrexham Borough Council. The museum sits a few miles outside of Wrexham on the slopes of Minera Mountain and a short distance from the village of New Broughton.

Admission to the site is free, but you have to enter the site through the visitor centre, where some well-structured, if a little wordy, bi-lingual displays give a brief history of lead mining in the area, though without going into too much detail on the technology involved (Plate 57). In terms of heritage management there is a panel describing how the

[69] Visited on 29th April, 2005

old mining area was reclaimed and indicating the decisions that were taken when deciding what to present to the public, i.e. that the presentation would be a mixture of original structures and replicas (Plate 58).

There is a shop in the visitor centre with a small selection of books on sale. However, there is little on sale directly related to lead mining other than one book on Minera Lead Mines and Quarries. A folded one-sheet site A3 photocopied guide and plan is available from the cash desk in the visitor centre at a cost of 10p[70]. The plan has points of interest numbered and described. However, in the guide used for this visit the photocopying had distorted some of the text and some text at the edges was missing. In one sheet the guide also does not have any space to go into detail on any of the mining and dressing processes, which gap is not filled by any on-site interpretation which simply consists of laminated A4 computer-printed numbers that refer back to the numbers in the guide. They look very home-made (Plate 59).

The site looks like it was well consolidated prior to its original opening to the public in the early 1990s. However, there is evidence at various points throughout the site of some of the cementation beginning to crumble (Plate 60), and there is generally a lot of loose rubble around the site. Steps, railings and platforms enable the public to get a close view of the main features of the site in safety (Plate 61).

Generally it is obvious which structures are rebuilt, which are replicas and which are originals (Plate 62), but in a few instances this is not obvious, especially with some of the machinery, such as a circular buddle (Plate 63).

4.2.2 Site Summary

There is a palpable air of neglect about this site. It shows in the quality of the presentation, especially the photocopied guide and the laminated numbers, but also in the general state of the site, which in general seemed to suggest not a lot of money is being spent on maintenance. The impression is of a site opened with the best of intentions in terms of presenting a worthwhile attraction to the public, but one that maybe thanks to budget considerations has fallen further down the council's priority list in the intervening years. This is despite some attractively designed pages advertising the site on the

[70] See Appendix D.3

council's website[71]. Admittedly, this visit was made mid-week, but during the whole period of the visit, there were no other visitors to the site.

Plate 57 - Displays in the Visitor Centre

Plate 58 - Panel describing the reclamation of the site

[71] See samples in Appendix E.3

Plate 59 - Laminated computer-printed number indicating one of the interpretation points on the photocopied guide

Plate 60 - The top of one of the consolidated walls. The cementation you can see crumbled to the touch

Plate 61 - Metal platform built to facilitate access to the structure around the mineshaft itself, the engine house and the headgear

Plate 62 - General view of mine area, showing a renovated engine house and chimney, replica headgear and part of the original dressing floor in front of the mine

Plate 63 - Circular buddle. Is the superstructure a renovation or a replica? The interpretation does not say

4.3 Snailbeach Mines[72]

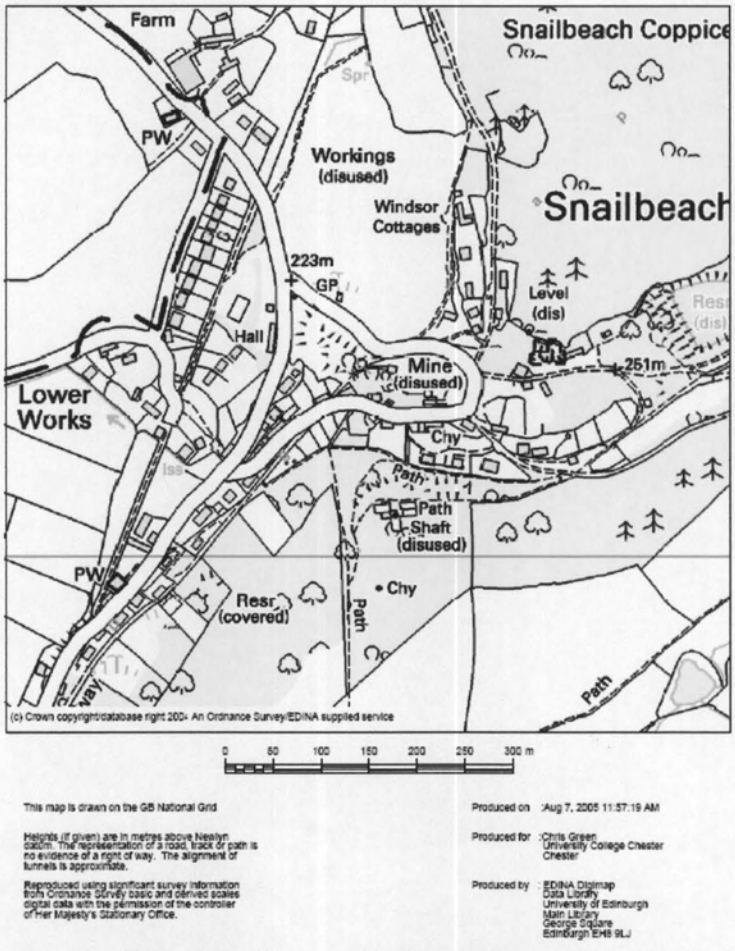

Figure 14 – Map of Snailbeach with the preserved mine remains in the centre. The smelting mill chimney lies in the wood to the south of the mine workings

4.3.1 Site Visit

The Snailbeach Mine complex is a second example of a local authority-managed site. It is the centrepiece of a Country Park run by Shropshire County Council adjoining the village of Snailbeach on the northern slopes of the Stiperstones. The Country Park is well flagged as you enter the village and the toilet block by the village car park has on its back wall a board containing information about the mines and a plan of the village showing all accessible mine workings (Plate 64).

No leaflets are available in the car park but a heritage trail is marked on the board and this is generally easy to follow on the ground. The path leads up from the car park to the main mine site, where a fragment of railway lies beside a duplicate of the car park mine

[72] Visited on 5th June, 2005

information board. On the other side of the rails, with a view of the main mine area, is a further board showing an artist's impression of the site with the major elements named, along with a plan of the mine and a rough chronology of its development (Plate 65).

A number of other interpretive panels are scattered through the site, for example a panel by the Lower Mine shaft entitled 'The Working Day' (Plate 66). This talks about working conditions in the mine and the 1895 disaster which befell the site, but nothing about the mechanics of the mine's operation or of how the various buildings round about fitted into the scheme of things, apart from the nearby Blacksmith's shop. Surprisingly, the mine shaft itself and the winding engine house are not interpreted, though the Working Day panel does show a sectional plan showing the underground workings. However, the writing on this is very indistinct.

There is an interpretation centre near the mine, closed on the Sunday this visit took place and with no indication of what the opening hours are. It has a sign indicating its restoration was supported by the Heritage Lottery Fund, and the nature of the restoration itself is reasonably obvious (Plate 67).

Further interpretive panels have been placed by the Compressor House and the Crusher House. The crusher house panel has a representation of the various stages of ore processing: crushing, jigging, buddling and finally smelting. This emphasises the absence of any interpretation of any of the technical aspects of mining.

Along with the restorations, a number of ruined structures appear to have been consolidated, presumably prior to the site's opening in 1995. This consolidation seems in a good state, though some of the remains are getting a little overgrown (Plate 68). The Engine House at the Upper Mine has its own interpretive panel, but again the mine shaft itself does not warrant a mention, despite the panel sitting alongside it. The remains in this area show more signs of potential problems. Some brick work has been damaged, presumably by people walking on it (Plate 69) and the engine house is in the process of being colonised by small shrubs as well as a rather large nest of wasps, neither of which can be doing much for the long-term stability of the fabric (Plate 70).

Further uphill is the Smelting Mill chimney which appears to be in a near perfect state, with a functioning lightning rod and signs of possible recent repair in the face above the flue entrance (Plate 71). The flue runs down a densely wooded hillside and is impossible to trace downhill. The mill itself is on private land and therefore inaccessible.

Outside of the confines of the Country Park itself there are a number of other industrial sites, some of which show evidence of active preservation activities, some of which do not. The adit entrances generally appear well preserved thanks to the activities of mining and caving enthusiasts, but are all locked and closed to the public[73]. The Candle House is in a parlous state of repair and close to collapse (Plate 72) whereas close by, the Powder House, though un-interpreted, is in a solid state of repair (Plate 73).

4.3.2 Site Summary

Like Minera, this has the feel of a site where money has been spent, and spent wisely, at a specific point in time, but where there are definite signs of current neglect. The interpretive panels are showing their age and are often illegible, and the fabric itself is just beginning to show signs of decay, despite careful consolidation and restoration. As at Minera, no other visitors were encountered, even though the village car park was full. The site seems more used by trail bikers and mountain bikers than by people visiting it for its subject matter. The lure of the nearby upland expanse of the Stiperstones seemed greater than that of some old lead mines.

[73] They appear to be the domain of the Shropshire Caving and Mining Club, who seem to guard them jealously

Plate 64 - Information Board on Snailbeach Mine, located in the Snailbeach village car park

Plate 65 - Panel in front of lower mine at Snailbeach, showing artist's representation, plan and chronology of site

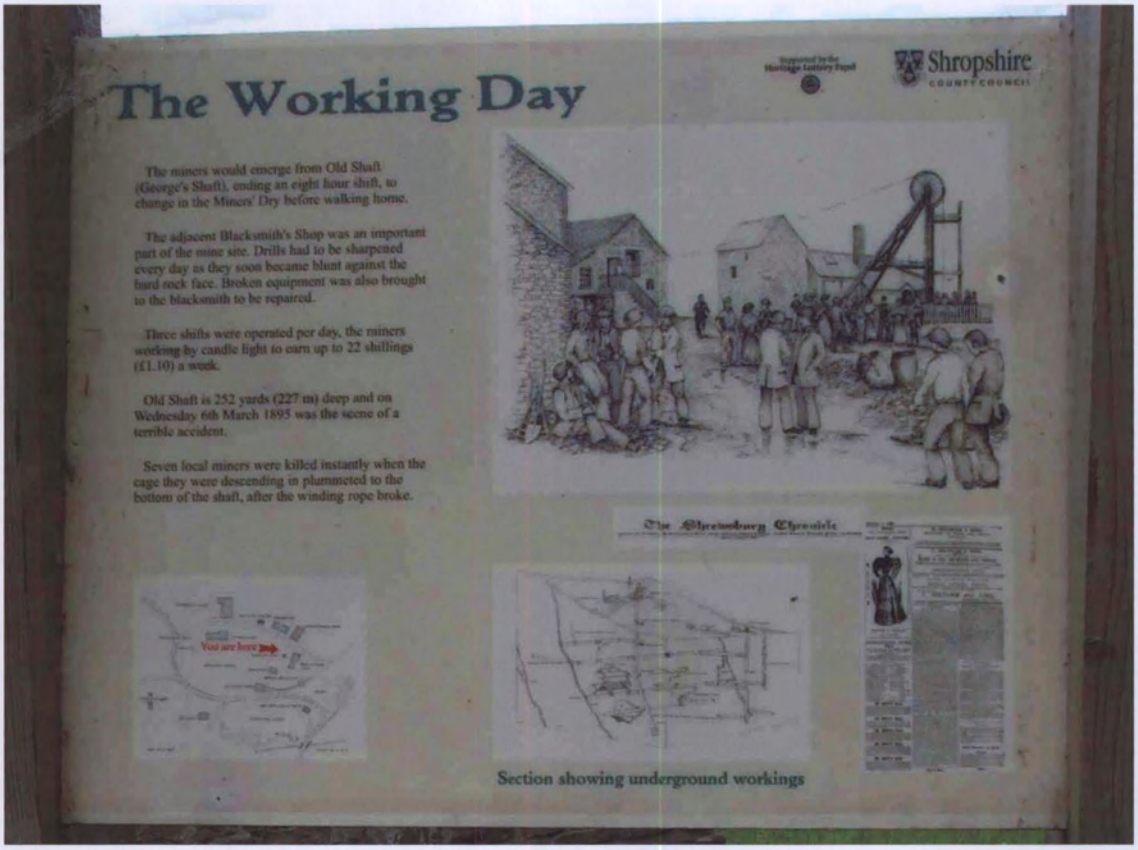

Plate 66 - 'Working Day' panel

Plate 67 - Interpretation Centre (formerly the miners' day house) with the Lottery funding sign above the door. See the restoration work above the door

Plate 68 - View of consolidated buildings showing advancing undergrowth

Plate 69 - Steps at side of Pump Engine House showing signs of erosion

Plate 70 - Side of Upper Engine House showing vegetation potentially destabilising the fabric. Below the shrub is a very active wasps' nest.

Plate 71 - Wall of Smelting Mill Chimney showing repointing

Plate 72 - The Candle House, slowly disappearing under advancing woodland

Plate 73 - The Powder House

4.4 Bryntail Mine[74]

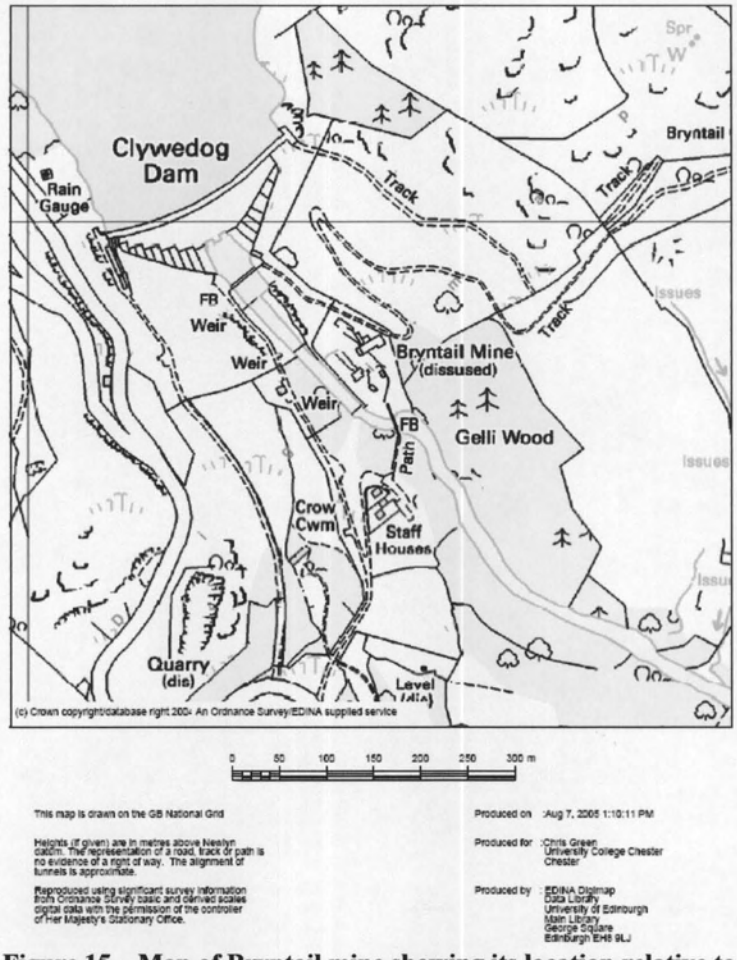

Figure 15 – Map of Bryntail mine showing its location relative to the Llyn Clywedog dam

4.4.1 Site Visit

Bryntail Mine is a 19th century lead mining site that is now to be found in the shadow of the Llyn Clwyedog dam, close to Llanidloes in Mid Wales. It was chosen for this study as an example of a relic of the lead industry cared for by a national statutory body, in this case Cadw, the historic environment agency for Wales.

The unmanned site is also noteworthy as a site consolidated and preserved in a traditional 'Ministry of Works' style, which is noticeable as soon as you enter the site. There are neatly clipped grass lawns (Plate 74), solidly consolidated structures with all rubble cleared away (Plate 75) and minimalist bi-lingual signs attached to each structure

[74] Visited on 5th March, 2005

indicating its use, e.g. "Ore Bin", "Dressing Building", "Leat", "Settling Tank", "Flue" etc. (Plate 76).

Cadw are obviously very safety conscious. There are also danger signs and protective railings at relevant points around the site to warn of problems (Plate 77).

As far as further interpretation is concerned, there is a descriptive panel at a point at the top of the site where most of the major mine structures can be seen. It makes good use of bilingual text, drawings, plans and cross sections, along with a map of the mine workings, though the style of the panel is a little dated (Plate 78). There are no other interpretive panels on the site, which makes it difficult when trying to make sense of the buildings as one is walking round.

4.4.2 Site Summary

Though information onsite is minimal, what there is along with the clean and uncluttered way in which the site is presented gives a reasonable picture of the way the mine operated. However, it could also be argued that the site is too clean to give a true picture of what the actual working conditions might have been like in the mine's heyday. It lacks a bit of grit and certainly a degree of authenticity. The overall impression is more of a medieval abbey being presented that a once living, breathing industrial unit. The contrast is interesting with the tangled state of the subsidiary site a short distance away that has not had the same treatment (Plate 79).

Plate 74 - Bryntail Mine. Note the traditional 'Ministry of Works' style of presentation as well as the Clwyedog dam behind

Plate 75 - Close up of one of the ore bins. Again this shows how 'clean' the presentation is with barely a stone out of place throughout the site

Plate 76 - The standard form of signage through the site. The picture also shows a close up of the standard of consolidation to be seen throughout the site

Plate 77 - Railings around the mineshaft. The site as a whole appears very safety-conscious

Plate 78 – The one descriptive panel visible on the Bryntail site

Plate 79 – Nearby ore bins. Spot the contrast with the Cadw site, especially the shrubs growing out of the bouse teams

4.5 Nenthead Mining Museum[75]

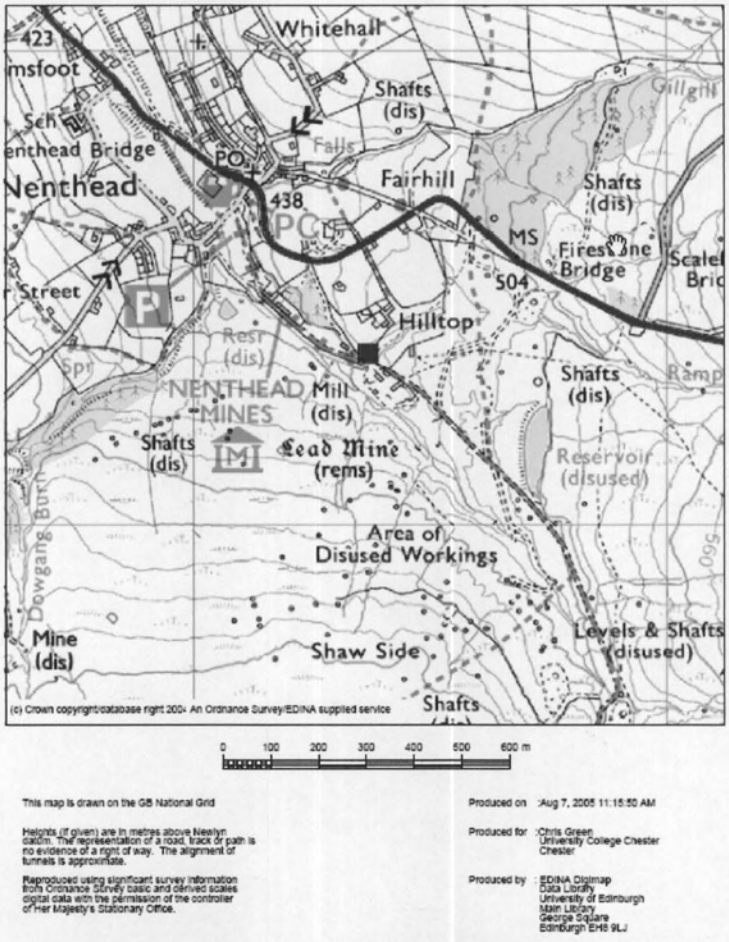

Figure 16 - Map of Nenthead Mines showing relationship of the mining museum to the village of Nenthead, the main area of mine workings and the main Penrith to Hexham road

4.5.1 Site Visit

Nenthead Mines is one of a small number of sites associated with the lead mining industry that is run as a commercial concern and therefore charges for admission. It is also one of few sites to be located both close to a settlement (Nenthead itself) and a main A-road, the main road from Penrith to Hexham. As befits a paying operation, the entrance to the site was via the gift shop and café, where payment was made (£6.50). This payment included an underground guided tour to the main mine on site, as a well as a plan of the site[76]. Also available at extra cost was a short but well presented and informative guide to the site[77]. The site is run by the North Pennines Heritage Trust

[75] Visited on 15th June, 2005
[76] See Appendix D.4
[77] See Appendix D.5

which took over the site in the 1990s and with the help of grants from English Heritage, the Heritage Lottery Fund and various local development agencies has been gradually developing the site for public access ever since. The site was first opened to the public in July 1996 and the last major new attraction, the underground mine tour, was officially opened in 2003[78].

What do you get for your money? Opposite the entrance is a Visitor Centre with exhibits on the basic geology and mineralogy through the coming of the London Lead Company and the development of the Nenthead model village, to the later activities of the Vielle Montagne Zinc Company and final decline[79] (Plate 80).

The guided underground tour of the Carr Level mine is well presented and informative presented with the minimum of trickery, just a cleared, consolidated and minimally-interpreted series of mine-levels that with the guide's own interpretation gave a good idea of how the mines were worked. Interestingly, the tour was originally intended to be partly self-guiding and audio equipment capable of giving pre-recorded commentary is visible at many places through the tour, put in at a total cost of £10,000[80]. However, as the mine is still officially classified as a working mine, health and safety concerns raised by the Mines Inspector meant the idea had to be abandoned and the equipment has never been used in anger. Access to the mine is therefore only through these guided tours.

The end of the guided tour brings you out near a dressing floor at the top end of the mine complex not yet properly conserved or interpreted, and therefore probably illustrative of the condition of the whole site prior to the activities of the trust (Plate 81). Presumably this area will eventually be properly consolidated and some interpretation put in. Indeed, further down the site there was evidence of some current work with a reconstruction of a launder crossing a valley linking two original tunnels (Plate 82).

The rest of the museum site is a mixture of cleared and consolidated mining and smelting remains; original preserved buildings used for presentations of particular aspects of work and life in Nenthead; plus complete reconstructions such as the launder and wheel at the

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[78] Information on dates gained from plaques on site

[79] According to the site guide the London Lead Company in various guises was present in the area from around 1700 until the end of the 19th century. The Belgian Vielle Montagne Zinc Company took over the mines and continued until the mid-20th century after which minor attempts to re-work spoil heaps petered out around 1960.
North Pennines Heritage Trust, *Nenthead Mines Guide Book* (NPHT, undated), p. 3

[80] Information provided during the guided tour by the guide, otherwise unsubstantiated

smelting mill site (Plate 85) and related exhibits such as the 'Power of Water' exhibit. The interpretation is bold throughout, with imaginative use made of audio presentations, touch screens, artists' impressions, archive photographs and clear and precise descriptions of processes and operations, with the occasional interactive diversion or working model especially aimed at children (Plate 86). Special emphasis is made on interpreting the everyday life of working people and their families and the paternalistic attitudes of the London Lead Company (Plate 87). A clear site identity in terms of lettering and presentation standards is carried through from the Visitor Centre, the various exhibits and the printed material.

Special mention should be made of the Smelting Mill. Though much of the structure was sadly demolished in the 1970s just before the idea of conserving such heritage really gained ground, it has enough remaining in terms of foundations and remaining structures above ground, along with the interpretation (Plate 83), to give a reasonable idea of the layout – the ore stores, the ore hearths, the reverberatory furnace as well as the flue and launder. The state of consolidation is very good (Plate 84).

4.5.2 Site Summary

As one might expect, as an attraction that charges admission, Nenthead Mines goes several steps further than the other sites visited in what it presents to the visitor and in how it presents it. There is evidence that this presentation is still in the process of development and that more will soon be available.

Having gone round the site, it is obvious that a major issue for the future commercial operation of this site could well be a dearth of visitors. This site visit took place on a warm summer Saturday afternoon and in over three hours the number of other visitors spotted was in single figures. Though the site is close to a village and to an A-road, Nenthead village is not an obvious tourist destination and the A-road is not in fact a major route that might bring large numbers of potential visitors.

For all that the site is extremely well-preserved, researched and presented, the worry has to be that in common with many of the other lead mining sites visited, its very remoteness might militate against it being a big commercial success. This problem may be illustrated by the shop. It has a limited number of books on mining, including Northern Mines Research Society publications and a useful text on Lead Mining

published by the North Yorkshire Area of Outstanding Natural Beauty but the number of other lines carried is small and trade does not appear to be brisk.

Plate 80 - Geological exhibit at the Nenthead Mines Visitor Centre. Note the use of touch screens

Plate 81 – Unconsolidated remains at the top end of the Nenthead site – a mixture of material from different phases of the site's development

Plate 82 - A reconstructed launder linking two sections of original tunnel

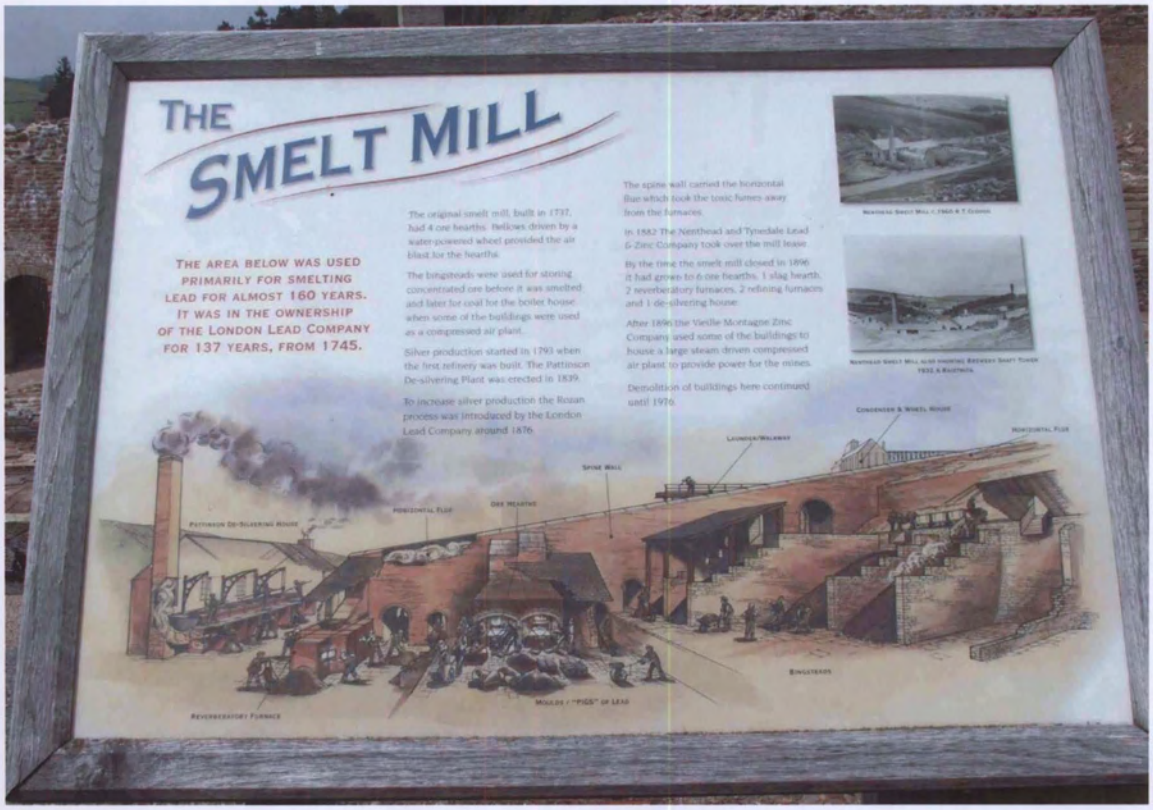

Plate 83 - Interpretive panel showing the basic elements of the Smelting Mill

Plate 84 - Smelting Mill from above showing the extent of visible remains plus general state of preservation

Plate 85 - Reconstructed water wheel and launder.

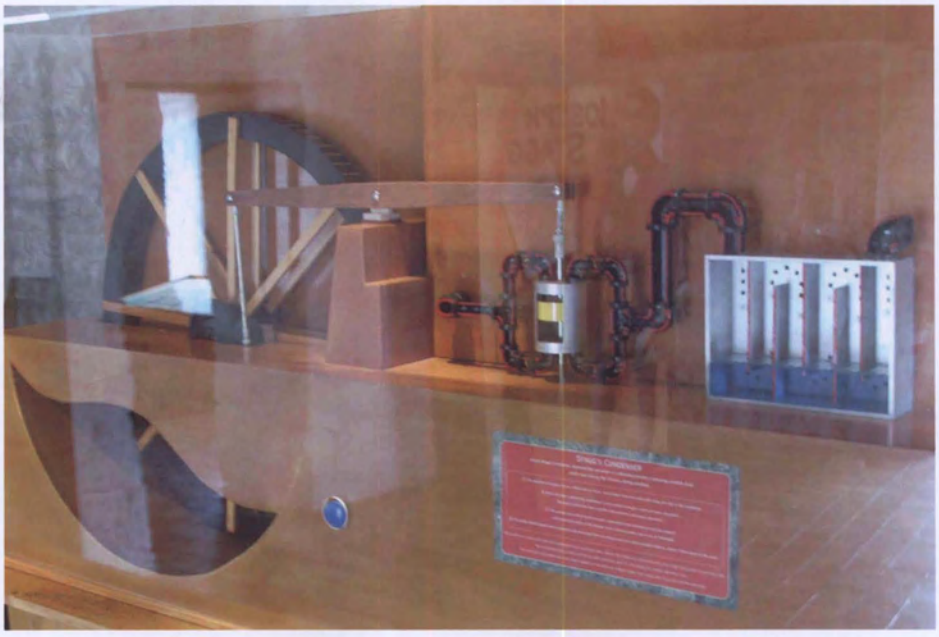

Plate 86 - Working model of the flue condenser, sadly not working on the day of the visit

Plate 87 - Part of The Nenthead Story, located in the Barracks

4.6 Magpie Mine[81]

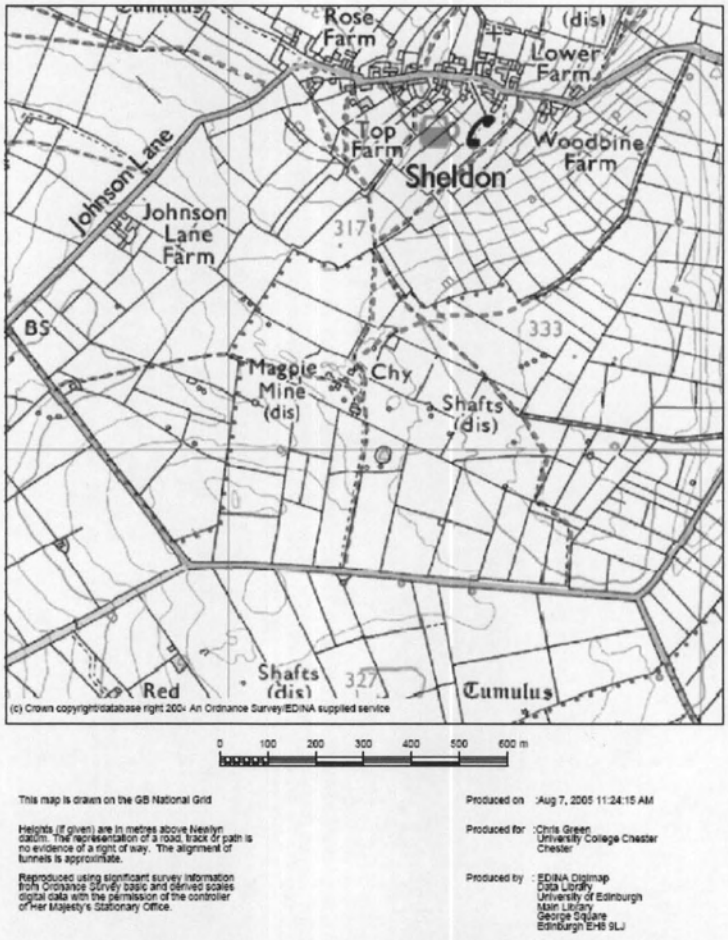

Figure 17 - Map of Magpie Mine area showing relationship to village of Sheldon. The line of the rake on which Magpie Mine sites can be traced across the map by following the mine workings

4.6.1 Site Visit

Magpie Mine is an example of a mine restored and maintained by a private trust, the Peak District Mines Historical Society (PDMHS), which was formed by a group of geologists working at Sheffield University in 1959. Since this time they have carried out a number of restorations of relics of the lead mining industry, including this site and Stone Edge Mill (see 4.7). The mine also lies within the boundary of the Peak District National Park. It stands high up on the limestone plateau to the south of the village of Sheldon, not far from Bakewell. Approaching the site, old bell pits indicate for some distance in either direction the line of the lead rake on which the mine sites. On entry to the site, a single

[81] Visited on 25th March, 2005

weather-beaten Peak District National Park sign warns of the dangers of the site (Plate 88).

Access to the site is free. The site was unmanned on the day of this visit, but when it is, a guide is available for £1 that gives a detailed history of the mine from its earliest days to its swansong in the 1950s, an annotated plan of the site and a suggested route round it. Rather less on the history and more on how the mine's actual operations are reflected in what is visible would have been appreciated, and the guide has a very home-made feel to it, especially the site plan reproduced in the centre pages[82].

First impressions are that the site is in an excellent state of preservation, but that without the guide the on-site interpretation was minimal, definitely an issue on days such as this when the site is unmanned. The building that served as the agent's house and smithy seems to show signs of a restoration in line with recommended techniques (Plate 89)[83], and the largest remnant of the old mine, the engine house and associated chimney of the mid-1850s has been carefully consolidated and preserved (Plate 90). There are few signs of damage to the fabric, some damage to a flue being one isolated example (Plate 91), and in its general clean appearance the site looked as though it is being actively maintained. All potentially dangerous mine-shafts have been capped.

There was obviously a relatively short period of time between the site closing in the 1950s and the beginning of the stewardship of the PDMHS, though the guide does not state exactly when this started. This means that the later features of the site, particularly the 1950s headgear and associated winding gear, are in pristine condition (Plate 92). Of all the sites visited, this is the only one which seems to have had the advantage of this near continuity. The PDMHS has also created a reconstruction of a horse-gin that would have been used to operate the winding gear of one of the deeper mine-shafts in the early 19th century.

Only one small, and rather old, interpretive panel is to be found on site, attached to the side of the corrugated shed holding the 1950s winding engine (Plate 93). This gives necessarily brief details of: the major structures on the site; the history of the mine in brief and a couple of mining anecdotes; where to get further information; and the site's Scheduled Ancient Monument status.

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[82] See Appendix D.2

4.6.2 Site Summary

Magpie Mine is a well restored and carefully maintained site that is let down by minimal interpretation, which may not be as much of a problem on days when the site is manned and further information is available but is a definite disadvantage on unmanned days. However, there are few signs of any active decay and the site as a whole appears in good health and in good stewardship. The reconstruction of the horse-gin is an interesting development that could usefully be taken further in other forms of reconstruction linked in with enhanced interpretation of the original features on the site.

[83] This building is now used as a field study centre

Plate 88 - Sign on approach to Magpie Mine

Plate 89 - Magpie Mine - The Agent's House. Note the obvious signs of reconstruction

Plate 90 - The original engine house that housed the 19th century Cornish beam engine, with the restored chimney alongside

Plate 91 – Damage to a flue

Plate 92 - Headgear from the mid-20th century reworking of the mine. It was driven by a former boat engine housed in a small corrugated shed

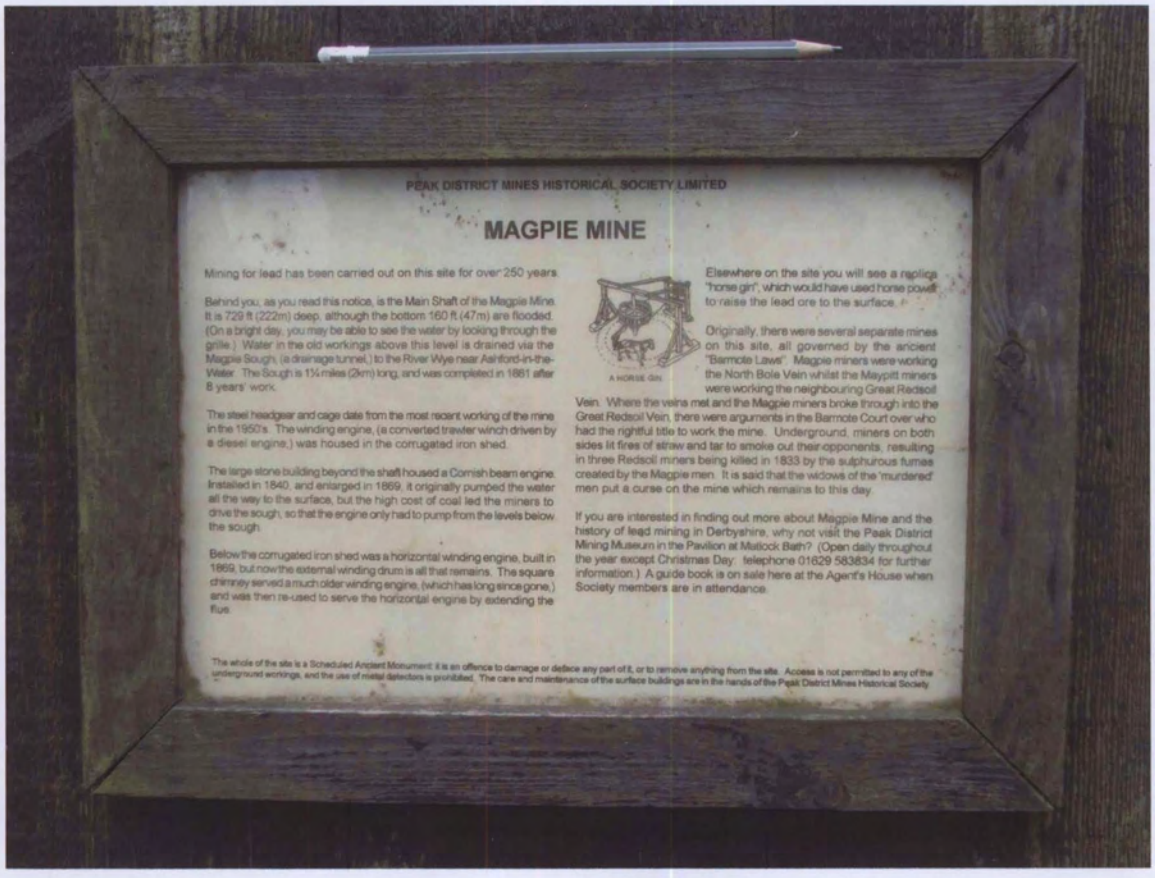

Plate 93 - The solitary interpretive panel at Magpie Mine, barely the width of two pencils

Plate 94 - A reconstruction of a horse gin/whim that may have operated the winding gear for this mineshaft. Note that the shaft is capped for safety

4.7 Stone Edge Mill[84]

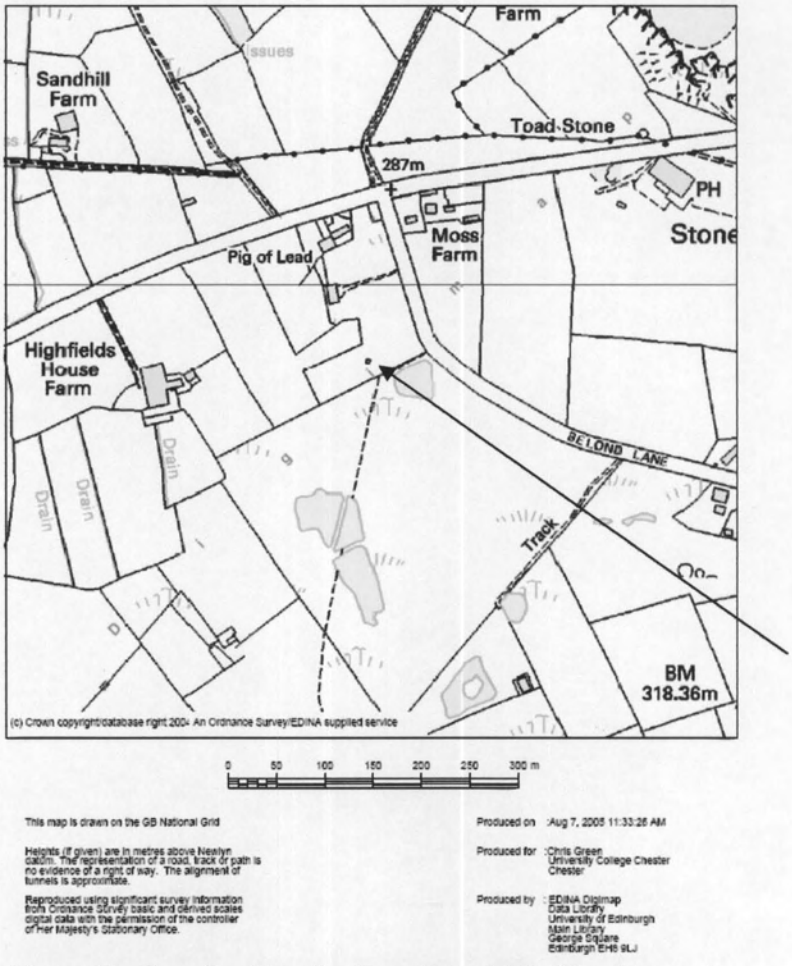

Figure 18 - Location Map for Stone Edge Mill. The chimney is marked by an arrow and the dammed pond is to the south-east

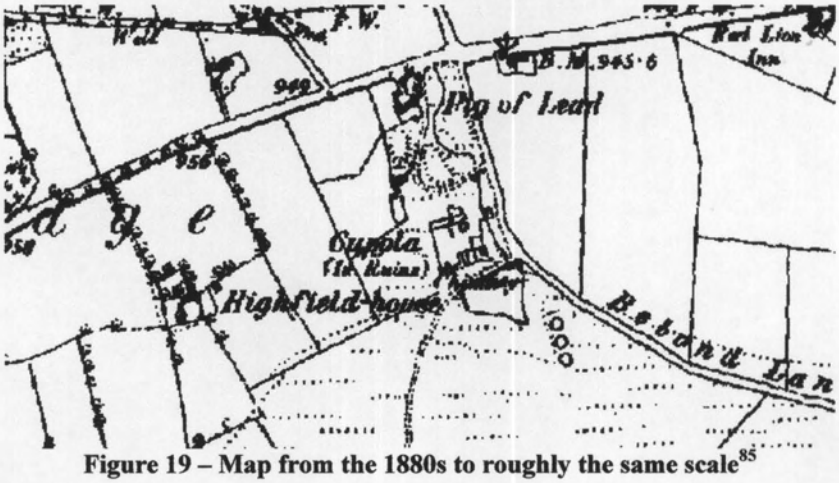

Figure 19 – Map from the 1880s to roughly the same scale[85]

[84] Visited on 10th July, 2005

[85] Taken from http://www.old-maps.co.uk/oldmaps/index_external.jsp?easting=433480&northing=366960 , dated 1883-1884 and accessed from the NMR entry for Stone Edge Smelt Mill on www.pastscape.org

4.7.1 Site Visit

Stone Edge Mill lies high up on the B road between Darley Dale and Chesterfield in Derbyshire and was chosen as one of the few examples of smelting mill remains still visible in the Peak District (though strictly speaking it lies just outside the National Park boundary). It is also another example of the activities of the Peak District Mines Historical Society (PDMHS).

The main features still visible are the smelting mill chimney and above it a small pond which provided water power to the mill. A public footpath leads along the mill dam to the chimney but is overgrown, though not as overgrown as the area around the chimney and around the site of the actual smelting mill.

A small plaque at the foot of the chimney gives summary details of the history of the chimney and its restoration by the PDMHS. This was almost completely covered by the undergrowth on the day of the visit, and would easily have missed by a casual visitor (Plate 96). The chimney itself appears in an excellent state of repair with a square stone tower topped off by several courses of brick (Plate 97). The restoration was in 1979, and it is not easy now to determine how much of the fabric may be reconstruction and how much original.

The top of the arch of the flue entering the chimney is visible and this is the only evidence of the flue. On one corner of the chimney some missing stones are the one piece of evidence of possible deterioration of the fabric since the restoration (Plate 98).

Of the smelting mill site itself there is little evidence amongst the generally disturbed ground below the chimney. However there is a densely overgrown mound where the old Ordnance Survey map (Figure 19) indicates the mill would have been – too dense to investigate but with some crumbling stonework visible in just one corner (Plate 99).

4.7.2 Site Summary

This is a confusing site. The National Monument Record entry describes it as "A well preserved example of a reverberatory smelt mill. The monument includes the smelt mill itself, a condensing flue and chimney and a mill pond to supply water to power the bellows for the slag hearth of the smelt mill."[86] However, the smelting mill itself appears

[86] NMR Number: SK 36 NW 8 *from* www.pastscape.org

buried under vegetation and generally there seems to be little sign of any attempt to conserve or preserve the site other than the chimney. There is also little sign that the site is ever visited, even the chimney despite its claims to be "the oldest industrial chimney in Britain". Though only a short distance from Chesterfield, this site is still relatively remote and it may be another case of out of sight, out of mind.

Plate 95 – The relationship of the chimney to the presumed site of the smelting mill, which lies under the undergrowth to the bottom right of the picture

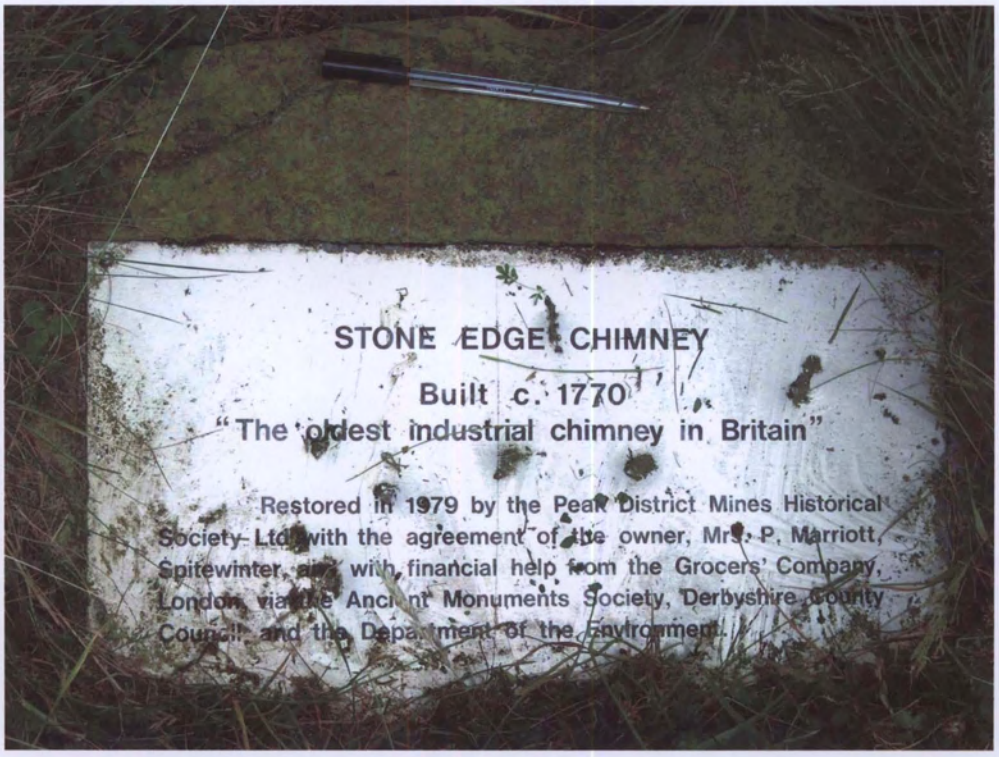

Plate 96 - The plaque at the foot of Stone Edge mill chimney. It was almost completely obliterated by the undergrowth on arrival at the sites

Plate 97 – View of Stone Edge Mill chimney showing both stone and brick courses

Plate 98 – Possible damage to the corner of the base of the chimney

Plate 99 – All that is apparently visible of the Stone Edge smelting mill

4.8 Section Summary

All of the sites visited are could be said to owe their current continued existence to the growth of interest in Industrial Archaeology, and the preservation of evidence of our industrial past, that began in the 1950s and 1960s. What is also noticeable is that many of the sites date their origins as preserved sites from what appears to be a burst of activity at the end of the 1980s and the beginnings of the 1990s. This could be conjecture, but it is true that this period came at the end of a long period of industrial decline and may signal the high-water mark of that interest. What was noticeable at every site was the following. Firstly, despite the site visits being mostly made on fine days through the summer of 2005, there was a significant absence of other visitors. Secondly, with the exception of the Nenthead Mines project which is still effectively in development, the interpretation schemes were either out-dated, deteriorating or, in the case of Minera, essentially amateurish. All of these suggested either declining funding or interest following the burst of enthusiasm that created the site in the first place. Further investigation would be required to establish if this were the case, and the danger if it were true would be that sites like Nenthead would begin to go the way of the other sites.

Having said that though, the sites are there, and in general the state of preservation is good. The intentions of the bodies in charge of the sites is also positive, as can be seen from websites such as those for Minera[87], and the Peak District Mines Historical Society[88], initiatives such as the Lead Rakes project, sponsored by the Peak District National Park Authority and English Heritage which attempts to put lead mining into the context of the overall landscape of the National Park and by doing so define a strategy for its continued preservation[89], and books such as that produced by the Durham County Council which tries to pull together as a landscape study the various relics of the lead industry in that the North Pennines, including Nenthead[90].

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[87] See Appendix E.3

[88] See PDMHS website http://www.tidza.demon.co.uk/

[89] The document that formed the output of the project is downloadable from the Peak District National Park website at http://www.peakdistrict.org/pubs/leadrakes/report.htm . A summary document is also available from English Heritage at http://www.english-heritage.org.uk/upload/pdf/48_The_Peak_District_-_Lead_Rakes_Project.pdf .

[90] I. Forbes, B. Young, C. Crossley & L. Hehir, *Lead Mining Landscapes of the North Pennines Area of Outstanding Beauty* (Durham County Council: Durham City, 2002)

5 Final Conclusions

By nature of their geological origins, veins of lead ore in Britain are largely restricted to upland areas. These are also areas where there is a plentiful supply of power immediately to hand, be it in the form of fast-flowing streams suitable for channelling to provide water power or of deposits of peat, or in some instances, of coal, that can be burned to power furnaces. As the lead mining and smelting industry developed, given these facts, and given also the basic toxicity of the grinding and smelting processes, it became the norm for all of these processes to be concentrated close to the mines, often therefore at a distance from the ultimate market for the metal (see Figure 20).

Figure 20 – Map showing employment in metal mining in 1851. It emphasises the concentration of lead mining employment (indicated by 'L') in upland areas and also shows the concentrations in the Pennines and the Peak District[91]

[91] J.B. Harley, *England circa 1850*, from ed. H. Darby, *A New Historical Geography of England* (Cambridge University Press: Cambridge, 1976), p. 254

Of the non-ferrous metals, lead achieved pre-eminence in the 19th century. It reached its zenith in the decade from 1860 to 1869 when production of metallic lead reached 68,000 tons per annum, more than twice the production from copper, tin and brass combined, and this was produced almost entirely from home-produced ore[92]. It was therefore an important component of the national economy, but the lead industry remained largely remote from the major centres of population of the Industrial Revolution. As a result, it never gained the wider awareness that coal mines, cotton mills and the like gained in the public's collective cultural consciousness through the 19th and 20th centuries. Charles Dickens and George Eliot never wrote novels about the plight of lead workers. They were never the subject of gritty film dramas or photo essays in the 20th century.

In a National Park such as the Yorkshire Dales, it must therefore be difficult to present the relics of the lead industry in an effective way because of their essential inaccessibility. This is in two senses, in a physical sense in that these remains are mostly to be found above the 1,000 foot contour in the bleaker and remoter areas of the Dales, and in a cultural sense in that the population as a whole generally know little about the subject, and it is more difficult to present it effectively than industries of which the public is more generally aware. This has led to a general trend, illustrated by many of the sites visited for this study, to present the remains very much in what Palmer and Neaverson call a 'consolidate as found' fashion[93], with attempts at conservation and preservation but little or no serious attempts at further restoration, interpretation and presentation. Whether this is the correct approach or not is open to question:

> "Strict conservation may sometimes be at odds with enhanced comprehension: conservation of monuments as ruins may be justified on archaeological grounds, but the base of a steam engine may seem almost meaningless to the non-archaeologist. Conservation of this kind necessitates further interpretation to suggest what the structure was and how it worked, how it became ruined and what is now missing."[94]

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[92] P. Mathias, *The First Industrial Nation* (Methuen: London, 1969), p. 485, after B.R. Mitchell & P. Deane, *Abstract of British Historical Statistics*, Cambridge, 1962, pp. 153-159

[93] M. Palmer & P. Neaverson, *Industrial Archaeology – Principles and practice* (Routledge: London, 1998), p. 155

[94] J. Alfrey & T. Putnam, *The Industrial Heritage – Managing resources and uses* (Routledge: London, 1992), p. 209

However, where attempts have been made to make the subject entertaining and educational, such as at Nenthead, the inaccessibility is still very much an issue. Another critical issue to take into consideration is that of climate. Most of these sites are in areas of high rainfall and poor drainage where wind and frost damage is also likely to be severe. Without adequate consolidation of the fabric of the sites, deterioration can be rapid once it gets a toe-hold. The general conclusion of this study must be, based on the evidence of a comparison between the evidence found by Robert Clough and the evidence found by this study, that within the Yorkshire Dales National Park the last 50 years has in most cases seen a moderate deterioration in the fabric of these sites (e.g. Grassington Moor, Old Gang and Surrender) and in some cases a catastrophic one (Cobscar). Only in one example, at Grinton Mill, did mitigating circumstances mean there was no significant deterioration in the fabric.

However, the fact is that the lead industry, like many other vanished or vanishing industries, was a major contributor to the British economy in its heyday, and as such could justifiably be said to have had just as much a part to play in any history of these islands as the more obvious political, social and economic threads running through it. If this statement is true, then it follows that there must be some responsibility on us to preserve evidence in some way for future generations.

This is easier to achieve for those industries in urban environments. Partly because the urban population are more conscious of their own industrial heritage it is easier to sell the concept of a redundant industrial facility being converted into a museum piece, be it as part of a fully fledged industrial museum such as at Blists Hill, Beamish or Abbeydale Industrial Hamlet or as an individual attraction such as Quarry Bank Mill at Styal or Shepherd Wheel in Sheffield. In line with Alfrey and Putnam's comments above, these are also not necessarily static museums. In all of the above sites attempts have been made to bring plant and equipment back into operation to provide a living experience of the industry in question. Where it is not possible to preserve sites in such a way as to demonstrate their original use, it is also easier within urban areas to find new uses for industrial buildings as flats, offices or leisure spaces. Examples of this might include the old Wilderspool Brewery in Warrington, now converted to offices, and Baltic Mill in Gateshead, now a major art exhibition space. Of course industrial buildings are being demolished all the time in urban areas and many are in advanced stages of dereliction, but

the imperative for preservation is always going to be greater in or close to towns and cities than in the areas where the sites surveyed for this study are to be found.

The scope for restoration and presentation of lead industry sites as living exhibits, or for their reuse, is limited. An attempt is being made at Nenthead and at a few other sites such as Wanlockhead in Southern Scotland and Killhope in County Durham to bring sites back to life in the working sense, and it will be interesting to see whether they can get themselves a sustained audience for what they are trying to do. No such attempts have been made within the Yorkshire Dales National Park, or indeed the Peak District National Park. In one of the sites surveyed, Grinton, a continued use was found for the smelting mill as an agricultural outbuilding and this has enabled a significant survival of original features within the mill which could if possible, and if the landowner permits, be the subject of a detailed restoration. The lead industry mostly died out in the Yorkshire Dales a century ago, though, and elsewhere the effects of neglect and climate have meant that many sites have been lost and many have deteriorated to an extent that makes effective restoration difficult.

What can one therefore do at a site such as Cobscar, where this deterioration is most marked, or even at sites such as Grassington or Old Gang? Any attempt at a basic interpretation scheme leaves it prey to the same forces that are attacking the buildings themselves, which is evidenced by the deteriorating state of the interpretation scheme on Grassington Moor which is barely five years old. Should one attempt some basic restoration and turn them into museum spaces? The track record at other sites outside a National Park is, as shown by some of the sites visited for this study such as Minera, not promising – a flood of good intentions in the late 1980s and early 1990s now seems beset by incipient neglect and a general lack of public interest. Consolidate, and maybe even restore, and then leave and hope for the best? Maybe, but Stone Edge chimney shows that what can happen here is that the site gradually disappears from view.

A possible way of increasing public awareness is Historic Landscape Characterisation. This is a programme promoted by English Heritage that "establishes an over-arching view of the whole historic landscape. It provides a base map for a better appreciation of separate places, but also offers an overall understanding of the whole"[95]. The programme

[95] G. Fairclough, *Boundless Horizons – Historic Landscape Characterisation* (English Heritage, undated) http://www.english-heritage.org.uk/upload/pdf/boudless_horizons.pdf), p. 23

creates an atlas of land use within a specific area and relates it to the entries in the Historic Environment Record (HER). In this way, industrial sites are not treated in isolation but put into the context of the overall landscape of an area that includes not just the industrial contexts but all of the other natural and human land use contexts as well. The 'Out of Oblivion' website set up by the Yorkshire Dales National Park is a good example of how this approach might work in terms of increasing the awareness of the general public. This website[96] allows you to take a specific area of the National Park, and home in on information on specific sites that are representative of specific activities characteristic of that area, which include lead mining and smelting. This includes information from the HER plus details of how to find the site and what you will find when you get there. A similar initiative has been launched by the Peak District National Park with their 'Time' web pages[97].

Money spent on websites will not of itself, however, keep these monuments to past industrial glories from crumbling into the moors on which most of them lie. As section 3 of this study showed, the National Park Authority and local authorities elsewhere are well aware of their responsibilities with regard to historic environments and those pertaining to the lead industry in particular. Voluntary bodies such as the Earby Mines Research Group or the Peak District Mining Historical Society can help, but as with any such group only as much money comes in as they can raise and they are being increasingly hidebound by rules and regulations that limit the work they can do.

Ultimately it is up to the statutory bodies within the National Parks to provide the impetus. Given the likely visitor numbers for these sites the scope for wholesale restoration and interpretation schemes, however desirable, is likely to be limited. Consolidation and conservation of all remaining sites is also doubtful. Choices will therefore need to be made as to what to conserve, restore or interpret and it is important that these be made for the correct reasons. A flue chimney may be a dramatic landmark visible for miles around but that should not qualify it of itself for a priority place in the conservation queue as may have been the case with the chimney above Cupola Mill on Grassington Moor, which has been restored while the smelting mill that fed it is quietly decaying below. Likewise the Cockbur Powder Store must have been fairly easy to

[96] See Appendix E.1
[97] See Appendix E.2

restore but its importance is of nothing compared to the mining and smelting remains nearby which have been left undisturbed. Decisions on priorities for conservation, preservation and restoration of specific sites should be made on the basis of a historical imperative; what are the most important sites in terms of keeping the essential processes of the industry visible for future generations to see? In the above example this might mean preserving a smelting mill and the processes involved within it ahead of simply preserving the last stage of that process, the evacuation of waste fumes through the chimney, and it might mean preserving the immediate surrounds of the mine such as the shaft, the headgear and the bouse teams ahead of a peripheral site such as a powder store. Whatever is or is not preserved, the statutory bodies should at the very least ensure that a permanent record is made of all relevant sites before their final decline.

The lead industry left a dramatic mark on the landscape of the Yorkshire Dales, and much of this is still clearly visible; the pock-marked trail of bell pits following the line of the lead vein through the landscape; the lunar landscape of spoil from later mines on which vegetation still has difficulty growing; the flues from the smelting mills snaking up the hillsides to finish dramatically in the waste chimneys perched on hilltops. However, it is becoming less visible and less distinct by the year. In an ideal world, public interest and enthusiasm would be sufficient to ensure survival of most, if not all of these sites. In reality, despite the best endeavours of the National Park and other authorities, and of groups of dedicated enthusiasts, this enthusiasm is going to be very difficult to generate. The moors where most of these sites are found are lonely places, the domain of hikers, mountain bikers and grouse shooters. Certainly from the experience of carrying out the field surveys in these studies, very few people visit these sites simply for what they are. Some sites off the beaten track, such as Cobscar, seem indeed barely to be visited at all. Much of what we see now may eventually disappear simply through neglect, maybe sooner rather than later. What we should ensure is that enough of what is left has a chance of surviving to be able to tell future generations a comprehensive story of how this metal was extracted, processed and finally used. What is clear from this study is that within the Yorkshire Dales National Park, and in other National Parks, the emphasis that the park authorities necessarily place on landscape, along with the powers available to them and the influence of dedicated archaeological officers such as Robert White, mean that the industrial landscapes of the lead industry have a better chance of survival there than elsewhere, despite any financial restrictions they may be under:

> "The management of historic industrial landscapes is therefore fraught with problems. Although many have been identified and often scheduled, their actual management as a cultural resource usually depends upon whether their environment is already subject to other forms of protection. It is fortunate, therefore, that many important industrial landscapes lie within National Parks. The park authorities have demonstrated an enlightened approach towards their management..."[98]

Outside the Yorkshire Dales National Park, the future survival of relics of the lead industry is more problematic. Section 4 of this study showed that a number of approaches have been adapted from basic consolidation to the development of fully fledged tourist attractions. The same problems of inaccessibility and lack of public interest seem to be affecting these sites, however, and it may require an effort of will on the part of the local authorities, trusts and other bodies that administer these sites both to maintain their upkeep and to present them in the wider cultural, spatial and historical context that is beginning to develop in the National Parks but appears lacking elsewhere where the sites tend to exist in isolation.

Finally, to widen this further, in essence this is no different for any other industry, both inside and outside National Parks. Many may not have the particular problems that this study has shown beset the lead industry, but other pressures exist for other industries. Preservation may be easier to justify in towns but the pressures of redevelopment and expansion within the urban environment put just as much pressure on the continued existence of industrial relics in towns as the elements do on the relics of the lead industry on our uplands. Also the rate of technological progress is such that we often do not appreciate the significance of some industrial sites until after they have gone, such as, for example, a factory manufacturing high tech components for computers that has closed because the components can be sourced more cheaply from abroad. The unit may only be twenty years old, but is it, or will it be in the future, of sufficient historical importance to justify the preservation of the building or of its contents?

What would be just as invidious as losing the record of the lead industry would be a situation where that industry is well recorded but we have nothing from the late 20th century computing industry in Britain. The decisions that need to be taken are therefore

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[98] Palmer & Neaverson, *Industrial Archaeology*, p. 155

very similar, to recognise what needs preserving and to preserve what you can and present it in as relevant a way as possible, but at the very least to preserve what is essential to keeping a complete record.

Appendix A Glossary of Lead Mining and Smelting Terms used in this study[99]

Term	Description
Adit	Underground tunnel, driven into a hillside, for giving access to mine workings or for draining water
Bell pit	A name often given to what might more properly be called a shallow shaft. An early method of digging down into a lead bearing vein, and widening the shaft as far as could be safely dug
Bouse	Lead-bearing ore, as brought out of a mine, before it is dressed or smelted
Bouse Team	Building or container for storing bouse
Buddle	A shallow pit in which running water is used to separate lead-ore from other materials
Candle House	A store house for candles used in lighting the mines
Concentrate	Dressed ore, ready for smelting
Condenser	A widened area of a flue, often filled with brushwood, for the purpose of condensing the lead content from the fumes going up the flue. The brushwood could then be burned to recover the lead oxide.
Cupola Furnace	Another name for a reverberatory furnace
Dressing Floor	Flat area where ore was broken up and separated into galena for smelting, and waste material for discarding
Flue	A long 'chimney' build uphill from a smelt mill, and usually along the ground, which served the twin purposes of taking poisonous fumes away from the mill and creating a strong draught for the furnace
Horse-gin	A winding shaft for drawing mined materials to the surface, powered by a horse walking around a winding gear.
Hush	A vein worked by damming up water and letting it rush down, thus uncovering new areas of vein
Launder	Channel for conveying water to a waterwheel
Leat	Water channel
Level	Horizontal runnel in a mine
Peat House	A building made for storing peat, one of the fuels commonly used in the smelting process

[99] Adapted and expanded from Morrison (1988), *Lead Mining in the Yorkshire Dales*, pp. 84 - 91

Term	Description
Powder House	Solidly built store used for housing explosive material used in blasting rock within the mines
Rake	A local Peak District team for a vein of lead ore and associated minerals, often several metres wide, extending up to hundreds of metres deep
Reverberatory Furnace	A type of furnace, introduced about 1700, which was designed for continuous running and smelting large quantities of lead ore. The lead ore did not come into contact with the fire, but the heat was reflected onto the concentrate
Roasting Hearth	Furnace for heating ore before smelting, to remove some of the sulphur content
Slag Hearth	Furnace for resmelting slag, to extract some of the remaining concentration of lead
Smelting	The conversion of lead mineral to metal by raising to a high temperature in a furnace
Spoil	Waste material left over from the separation processes on the dressing floor; it was generally tipped to form spoil heaps
Vein	A deposit of lead ore in the ground, usually in the form of a vertical ribbon

Appendix B Planning Policy Guidance – Scheduled Ancient Monuments

Appendix C Yorkshire Dales Policy Document (extract)[104]

DRAFT

YORKSHIRE DALES NATIONAL PARK

THE LEAD INDUSTRY

A programme for investigation, recording, consolidation and interpretation

Appendix D Sample Literature

Appendix E Sample Web Resources

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www.old-maps.co.uk – source for old Ordnance Survey maps

www.outofoblivion.org.uk – the Yorkshire Dales NPA 'Out Of Oblivion' website

www.pastscape.org – English Heritage website for access to the National Monument Record

www.peakdistrict.org – Peak District National Park Authority

www.peakdistrict-nationalpark.info/time - the Peak District NPA 'Time' website

www.tidza.demon.co.uk – Peak District Mines Historical Society

www.wrexham.gov.uk – Wrexham Borough Council

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